



# Worldwide

## Information Services Program

September 18, 1996

Dear Colleague:

Enclosed is the third quarter (3Q96) distribution of deliverables for your subscription to *INPUT's Worldwide Information Services Program*. Included are the following:

(1) Country/Regional Profiles (including forecasts):

- North American Region
- Canada
- Mexico
- Latin American Region
- Argentina
- Brazil
- Venezuela
- Other Latin America
- European Region
- Central and Eastern Europe
- United Kingdom
- Mediterranean Countries/Ireland (Includes Greece, Portugal, Spain and Ireland)
- Middle Europe (Includes Austria, Belgium, the Netherlands and Switzerland)

(2) Country/Region Forecast Sheets:

- Worldwide
- Middle East/Africa Region
- Asia/Pacific Region
- Australia
- China
- Hong Kong
- India
- Japan
- New Zealand
- Singapore
- South Korea
- Taiwan
- Other Asia/Pacific

(3) A 3.5" disk containing the *Worldwide Information Services Market Forecast Compendium, 1995-2000*, a database in Excel spreadsheet format. The disk is inserted in a plastic holder which should be placed in your binder directly behind the *Forecast Compendium* tab. The disk also contains a README.DOC which identifies each of the country and regional files by its Excel file name.

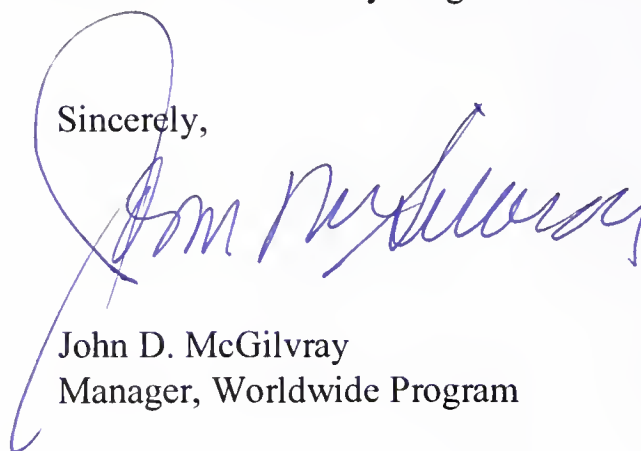
(4) A new *Table of Contents* to be inserted behind that tab.

The new profiles and forecasts should be placed behind their regional tabs as indicated in the *Table of Contents*, and the existing forecast sheets for profiled countries (included in this distribution) should be relocated, in alphabetical order, to the tabbed section, *Forecast Compendium*. By the end of 1996, all forecast sheets will be replaced by profiles in the following quarter. The displaced one-page forecasts will be re-filed behind the *Forecast Compendium* tab, resulting in an immediately available "quick reference" to country and regional information services market financial data.

A separate, printed and bound version of the *Worldwide Forecast Compendium, 1995-2000*, will be sent to you in October. Similar in style and content to last year's *Compendium*, it contains the same forecast tables as those that are located (in loose-leaf form) behind the tab, *Forecast Compendium*, but in a bound, concise, easily transported format.

INPUT appreciates your purchase of the *Worldwide Information Services Program* and we are confident that it will continue to be a valuable resource for use in your global business activities.

Sincerely,



John D. McGilvray  
Manager, Worldwide Program

Attachments



# Worldwide

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## Information Services Program

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# WORLDWIDE INFORMATION SERVICES PROGRAM

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| Europe (1995-2000)        |                 | European Region<br>Austria (Middle Eur.)<br>Belgium (Middle Eur.)<br>Central/Eastern Europe<br>Denmark (Nordic)<br>Finland (Nordic)<br>France<br>Germany<br>Greece (Med. & Ireland)<br>Ireland (Med. & Ireland)<br>Italy<br>Netherlands (Middle Eur.)<br>Norway (Nordic)<br>Portugal (Med. & Ireland)<br>Spain (Med. & Ireland)<br>Sweden (Nordic)<br>Switzerland (Middle Eur.)<br>United Kingdom |
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North American Region  
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**Tab****Forecast****Profile & Forecast**

South Korea

Sweden

Switzerland

Taiwan

United Kingdom

United States

Venezuela

Disk: *Worldwide Market Forecast  
Compendium, 1995-2000*

**Other**

(No entries)











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## PROFILE

# Worldwide Summary

December 1996

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## Geographic Area Definition

This profile provides a summary of the worldwide information services market and consolidates the data for the Asia/Pacific, European, Latin American, Middle East/African and North American regions into a single, global perspective.

## Economic Overview

Despite a few highly publicized areas of political unrest, the worldwide economic condition is one of relative stability, with a slow, but steady increase in global production and inflation under control. After a prolonged period from 1991 through 1995, when real GDP growth exceeded 2.5% in only one year (1994—3.0%), the worldwide GDP grew 2.4% in 1995, is expected to grow 2.7% in 1996, and should reach 3.2% in 1997. Increased production is projected to occur for each succeeding year through the millennium and beyond. Balancing this growth is a decline in inflation from 7.1% in 1995 to 5.0% by 1997—with a steady-state 4.7% projected throughout the balance of this century. The growth in production and the reduced inflation rate reflect the cautious optimism of the global economic community.

The industrialized nations have streamlined both their government and business activities, with emphasis on privatizing inefficient public sector functions and improving economic infrastructure in governments, while businesses concentrate on improving efficiency and competing in expanding global markets. The financial community shares the general economic optimism, and there is a ready availability of investment capital to feed business expansion. Unemployment is a concern, as is underemployment (a condition more common in emerging nations), but more and more programs are being established to retrain employees displaced by economic and business change (e.g., downsizing), and to provide marketable skills to members of labor forces newly entering global markets (e.g., South Africa, Latin America and India).

The U.S. economy continues to expand at a rapid pace, Europe is experiencing renewed growth, Japan's economy is again moving in a positive direction, Latin America's political and economic problems are starting to come under control, South Africa—minus *apartheid*—is starting to strengthen and expand its economy, the Asia/Pacific nations' economies—both emerging (Malaysia, India and others) and established (South Korea, Singapore)—are expanding, and the Chinese Economic Area (China, Hong Kong and Taiwan) is poised to become a major global economic power. The opportunity for worldwide business and economic growth is bright, and barring any unforeseen circumstances, should remain so through the turn of the century.

Exhibit 1 notes two key indicators of worldwide economic health—global real GDP growth and worldwide inflation rates.

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#### Exhibit 1

#### Key Economic Indicators—Worldwide

| Indicator       | Value |
|-----------------|-------|
| GDP Growth Rate |       |
| - 1995          | 2.4%  |
| - 1996          | 2.7%  |
| - 1997          | 3.2%  |
| Inflation Rate  |       |
| - 1995          | 7.1%  |
| - 1996          | 5.5%  |
| - 1997          | 5.0%  |

Source: BofA World Information Services, 1996

## Information Services Market Forecast

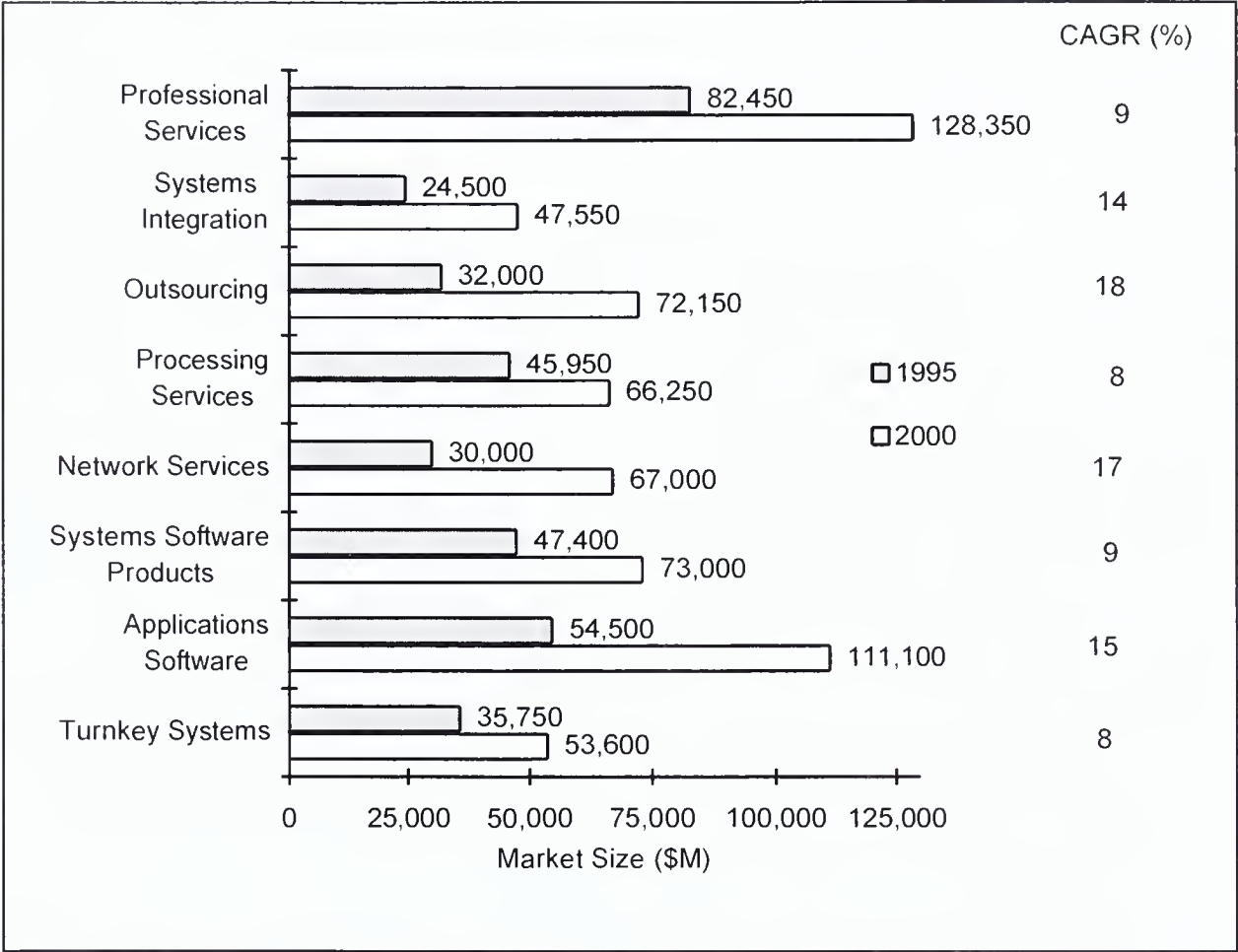
The worldwide market for information services reached \$318.7 billion in 1994, and grew 11% to \$352.6 billion in 1995. Reacting to the climate of global growth and expansion, the information services market is forecast to reach \$619 billion by the millennium—a compound annual growth rate (CAGR) of 12%.

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year CAGR percentage, in millions of U.S.\$.. A forecast, by year, of each product/service category is provided in the Forecast Database section.



Exhibit 2

Market Forecast by Product/Service Category  
Worldwide, 1995 - 2000



Numbers are rounded.

Source: INPUT

Professional services, the largest product/service category, will continue its steady growth as businesses: seek skills in limited supply to help chart IT directions and strategies; require assistance in software development efforts; and train and retrain internal staff in IT-related skills. Systems integration growth will be more rapid, at a 14% CAGR for the forecast period, as companies in all regions recognize the benefits of using skilled professionals to combine diverse platforms and operating environments, expand existing systems, or move to new system architectures. Outsourcing will be the fastest growing of all service categories. Driven by a renewed emphasis on core competencies and the cost effectiveness of contractually controlled costs, this market will reach more than \$72 billion by the turn of the century. Processing services growth is steady at 8%, an indication of the value placed upon “pay-as-you-go” and usage-sensitive resources by both established and growing businesses.

Network services will be the second-fastest growing market, with a CAGR of 17% for the forecast period. Driven by the Internet and the expanding telecommunications infrastructure necessary to the conduct of electronic business in both domestic and global markets, this service area could well see even more aggressive expansion as the impact of both the Internet and “intranets” becomes more clearly defined.

Software products, combined, account for \$184 billion in global spending and 30% of the market for information services in the year 2000. This is up from \$102 billion and 29% in 1995. The strongest growth will occur for operating systems and applications products for the workstation/PC platform, while mainframe products will be developed for enterprise-wide, compute-intensive, and “super-server” applications.

Turnkey systems are finding new life on smaller, desktop platforms. Long regarded as used primarily in manufacturing, process control, localized financial (e.g. credit union) and medical/technical applications, the integrated systems are now also performing human resources, accounting, insurance and other applications functions.

Exhibit 3 shows the relative percentage of the worldwide information services market held by each product/service category in 1995 and 2000.

Exhibit 3

Product/Service Category Percentages of Total Worldwide Information Services Market, 1995 and 2000

| Product/Service Category       | Market Share - 1995 | Market Share - 2000 |
|--------------------------------|---------------------|---------------------|
| Professional Services          | 23%                 | 21%                 |
| Systems Integration            | 7%                  | 8%                  |
| Outsourcing                    | 9%                  | 12%                 |
| Processing Services            | 13%                 | 11%                 |
| Network Services               | 9%                  | 11%                 |
| Applications Software Products | 15%                 | 18%                 |
| Systems Software Products      | 13%                 | 12%                 |
| Turnkey Systems                | 10%                 | 9%                  |

Note: Numbers are rounded and may not total to 100%.

Source: INPUT

Based upon increased market share, outsourcing, applications software and network services, in that order, offer the best information services growth opportunities.

Comparative regional shares of the 1995 and 2000 information services markets are shown in Exhibit 4. Because of the size and strength of the United States market, the North American region will show the strongest growth. Asia/Pacific would have had stronger growth were it not for the diluting effect of Japan, which represents 84% of the 1995 Asia/Pacific information services market and 76% of the 2000 market, and is only growing at an 8% CAGR for that period—well below the 11% to 31% recorded by other Asia/Pacific nations and less than the regional average of 11%. Europe’s 8% rate of growth is well below the global average of 12% for the forecast period and accounts for that region’s diminished market share.

Exhibit 4

**Regional Percentages of Total Worldwide  
Information Services Market, 1995 and 2000**

| Region             | Market Share - 1995 | Market Share - 2000 |
|--------------------|---------------------|---------------------|
| Asia/Pacific       | 21%                 | 20%                 |
| Europe             | 25%                 | 22%                 |
| Latin America      | 2%                  | 2%                  |
| Middle East/Africa | 1%                  | 1%                  |
| North America      | 52%                 | 56%                 |

*Note. Numbers are rounded and may not total to 100%.*

*Source: INPUT*

Exhibit 5 offers the 1994-1995 growth rates for total information services spending for the world and the regions indicated, followed by the five-year CAGRs for the period 1995-2000.

Exhibit 5

**Regional Growth Percentages  
Worldwide Information Services Market, 1995 and 2000**

| Region             | 1994-1995 Growth | 1995-2000 Growth |
|--------------------|------------------|------------------|
| <b>Worldwide</b>   | <b>11%</b>       | <b>12%</b>       |
| Asia/Pacific       | 10%              | 11%              |
| Europe             | 7%               | 8%               |
| Latin America      | 15%              | 17%              |
| Middle East/Africa | 16%              | 19%              |
| North America      | 13%              | 14%              |

*Source: INPUT*

All regions, and the world, will grow at a faster CAGR from 1995 to 2000 than they did from 1994 to 1995—a general reflection of the health of the global economy. However, if Japan’s market is removed from the Asia/Pacific figures, the growth rates in 1995 and the period 1995-2000 become 17% and 20%, respectively—the highest for all regions. Much of Latin America’s and the Middle East/Africa’s growth is the result of starting from relatively small bases, but these numbers also represent the significant potential of these regions.

Exhibit 6 notes the largest information services markets in each country in the year 2000, and the fastest growing markets for the forecast period, 1995-2000.

Exhibit 6

**Largest and Fastest Growing Information Services Markets, by Region  
Worldwide, 1995-2000**

| Region             | Largest Markets, 2000  | Fastest Growing Markets (95-00)  |
|--------------------|--|--|
| Worldwide          | <ul style="list-style-type: none"><li>• Professional services</li><li>• Applications Software Products</li></ul> | <ul style="list-style-type: none"><li>• Outsourcing</li><li>• Network Services</li></ul>                         |
| Asia/Pacific       | <ul style="list-style-type: none"><li>• Professional Services</li><li>• Processing Services</li></ul>            | <ul style="list-style-type: none"><li>• Network Services</li><li>• Applications Software Products •</li></ul>    |
| Europe             | <ul style="list-style-type: none"><li>• Professional Services</li><li>• Applications Software Products</li></ul> | <ul style="list-style-type: none"><li>• Outsourcing</li><li>• Network Services</li></ul>                         |
| Latin America      | <ul style="list-style-type: none"><li>• Applications Software Products</li><li>• Professional Services</li></ul> | <ul style="list-style-type: none"><li>• Applications Software Products</li></ul>                                 |
| Middle East/Africa | <ul style="list-style-type: none"><li>• Professional Services</li><li>• Applications Software Products</li></ul> | <ul style="list-style-type: none"><li>• Professional Services</li><li>• Applications Software Products</li></ul> |
| North America      | <ul style="list-style-type: none"><li>• Applications Software Products</li><li>• Professional Services</li></ul> | <ul style="list-style-type: none"><li>• Network Services</li><li>• Outsourcing</li></ul>                         |

Source: INPUT

Professional services and applications software products will generally be the largest markets in all regions (except Asia/Pacific) in the year 2000; however, outsourcing and network services will normally be the fastest growing. Size (the largest markets) is in part a function of the long-standing importance to business of the market segments noted. Importance for *future* business growth is an attribute of the fast-growing segments, and both outsourcing (for cost-control and resource availability) and network services (for the conduct of both local and global electronic business) are key elements in the business plans of most companies for the next decade.



## Software and Services Vendors

The following table (Exhibit 7) notes the major worldwide software and services vendors, with an indication of their country of origin, the percentage of the global market for information services that they command (to the nearest whole percentage), and whether the vendor's primary information services offerings are software products (SW), services (Svcs) or both. Software products does not include client-specific software development activities such as those performed by professional services companies, but is limited to "packaged" software that is generally ready for immediate use by the purchaser.

Exhibit 7

**Major Software and Services Vendors—Worldwide, 1995**

| Company Name        | Country of Origin | Est'd Mkt Share | Offerings<br>SW   Svcs |
|---------------------|-------------------|-----------------|------------------------|
| IBM                 | United States     | 6%              | X X                    |
| EDS                 | United States     | 2%              | X                      |
| Fujitsu             | Japan             |                 | X X                    |
| Microsoft           | United States     |                 | X                      |
| Andersen Consulting | United States     | 1%              | X                      |
| CAP GEMINI S.A.     | France            |                 | X                      |
| Computer Associates | United States     |                 | X                      |
| CSC                 | United States     |                 | X                      |
| Digital Equipment   | United States     |                 | X X                    |
| Hewlett Packard     | United States     |                 | X X                    |
| NEC                 | Japan             |                 | X X                    |
| NTT Data            | Japan             |                 | X                      |
| Oracle              | United States     |                 | X                      |
| Reuters             | United Kingdom    |                 | X                      |
| SNI                 | Germany           |                 | X X                    |
| Unisys              | United States     |                 | X X                    |

Source: INPUT  
and various published financial data for 1995.

## IT Spending

The following table (Exhibit 8) offers INPUT's estimate of IT spending worldwide. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services



spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product or service.

Exhibit 8

**1995 IT Spending—Worldwide**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 108,050                                     | 8%                            |
| Internal Staff           | 407,900                                     | 32%                           |
| Equipment                | 243,550                                     | 19%                           |
| Equipment Services       | 76,200                                      | 6%                            |
| Facilities               | 97,300                                      | 8%                            |
| Information Services     | 352,600                                     | 27%                           |
| <b>Total IT Spending</b> | <b>1,285,600</b>                            | <b>100%</b>                   |

*Numbers are rounded.*

*Source: INPUT*

Internal staff and equipment spending are down 2% and 1%, respectively, from 1994 levels, while information services spending is up 3%—from 24% of IT spending in 1994 to 27% in 1995. The change reflects the shift to external resources (outsourcing, professional services, etc.) in 1995 as economic conditions stabilized and improved. Businesses felt comfortable investing in capital equipment to produce core products, and contemporary financial management strategies emphasized the shifting of some IT function to outside specialists who could both control costs and provide needed IT function at predictable and dependable resource levels. The rapid pace of technological change has also produced a shortage of critical IT-related professional skills, and information services firms provide an excellent resource for distributing such skills where they are needed while limiting the costs to specific project-related activities, rather than internal IT overhead. This trend will continue through the end of this century.

## Information Services Forecast Database

This section contains the complete worldwide information services forecast database (Exhibit 9) for the period 1995-2000.

## Exhibit 9

**Information Services Market  
Worldwide, 1995-2000**

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>WORLDWIDE TOTAL</b>          | 318,696    | 11%              | 352,586    | 392,316    | 439,805    | 490,518    | 553,459    | 619,008    | 12%            |
| <b>Professional Services</b>    | 76,121     | 8%               | 82,473     | 89,254     | 98,164     | 107,220    | 118,315    | 128,344    | 9%             |
| <b>Systems Integration</b>      | 22,036     | 11%              | 24,492     | 27,938     | 32,057     | 36,536     | 41,870     | 47,527     | 14%            |
| <b>Outsourcing</b>              | 26,829     | 19%              | 32,016     | 37,220     | 44,038     | 51,908     | 61,500     | 72,155     | 18%            |
| <b>Processing Services</b>      | 42,596     | 8%               | 45,961     | 49,040     | 53,319     | 57,249     | 61,912     | 66,250     | 8%             |
| <b>Network Services</b>         | 26,124     | 15%              | 29,981     | 34,614     | 40,759     | 47,757     | 56,618     | 67,002     | 17%            |
| <b>Applications SW Products</b> | 47,885     | 14%              | 54,492     | 63,707     | 73,239     | 83,239     | 96,780     | 111,114    | 15%            |
| <b>Systems SW Products</b>      | 43,688     | 9%               | 47,414     | 51,866     | 56,231     | 60,976     | 66,897     | 72,998     | 9%             |
| <b>Turnkey Systems</b>          | 33,417     | 7%               | 35,757     | 38,677     | 41,998     | 45,633     | 49,567     | 53,618     | 8%             |

Source: INPUT











# Worldwide

## Information Services Program

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REGIONAL PROFILE

ASIA/PACIFIC

## Asia/Pacific

December 1996

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### Geographic Area Definition

The Asia/Pacific region consists of Australia, China, Hong Kong, India, Japan, New Zealand, Singapore, South Korea and Taiwan (for which separate country profiles are written), and the smaller, emerging Asia/Pacific economies of Indonesia, Malaysia, the Philippines and Thailand, profiled as a “country grouping,” *Other Asia/Pacific*. China was previously included in the *Other Asia/Pacific* grouping, but as more data has become available for that country, it has been removed from that collection and is profiled in 1996 as a separate nation.

### Economic Overview

The Asia/Pacific countries are considered one of the most exciting and potentially rewarding economic growth areas of both this decade and the next millennium. Japan dominates this region in terms of economic size and total national productivity, but its rate of growth has slowed dramatically from prior years, while traditionally strong contenders such as South Korea, Taiwan and Singapore continue their steady growth, with low inflation rates and low levels of unemployment. Viewed as the logical successors to Japan's image as the paradigm of effective long-term national economic planning, these three countries have achieved success through long-term economic initiatives, strong and effective marriages between the state and economic and business communities, a tendency to import knowledge rather than technology, patience, and a sense of where they want to position their countries in the global economic community.

Hong Kong, a world-class financial and trade center, appeared to have an uncertain future a few years ago, as the time for it to revert to China approached—July 1, 1997. Now, China's more temperate image and its clear intent to treat its new “Special Administrative Region (SAR)—Hong Kong—like the golden goose that it is, have restored confidence that Hong Kong will retain its position as one of the, if not “the” major trading

and financial communities in the Asia/Pacific region. Although China continues to have differences with Taiwan, most experts believe that they will be resolved without conflict and that the triumvirate of China, Taiwan and Hong Kong—known as the “Chinese Economic Area” (CEA)—could become the dominant economic entity in the region and a major factor in world trade.

Lurking on the horizon is the next wave of emerging nations, the ASEAN countries of Indonesia, Malaysia, the Philippines and Thailand. These countries are following the economic path defined by South Korea; their low labor rates allow them to provide cost-effective offshore assembly sites for the more advanced industrial nations such as Japan and South Korea, thereby reducing labor costs for their clients while establishing and expanding their internal skill and technology infrastructure. The next logical step is to move strongly into light industrial production, and then, according to each country’s economic objectives, to heavy industry. Countries such as India and the Philippines have also found a new economic cornucopia—offshore programming. India is now generally regarded as the definitive site for offshore program development and is strengthening this capability through government and educational programs to develop additional programming expertise. Both India and the Philippines have government programs aimed at expanding the country’s programming resources with the objective of capitalizing on this growing market and becoming global sites of choice for offshore programming activities.

Key economic indicators for thirteen Asia/Pacific nations are summarized in Exhibit 1. The inflation rates are for 1995. Unemployment numbers are the latest available, for the year indicated, and do not take into account *underemployment*, a common condition in the Asia/Pacific region. Exchange rates are in units of local currency to purchase one U.S. dollar. Sources for this data are noted in the footnotes to the table.

*Business Conditions* - As demonstrated by the region’s current and projected strong increases in real GDP (the highest of any of the five regions covered in INPUT’s *Worldwide Information Services Program*), the Asia/Pacific region is clearly a vital and growing community with an economic, political and financial climate that will foster strong business growth well into the next millennium. The global investment community has recognized the opportunity for some time and has been providing a steady stream of capital for both new and growing business ventures. Governments recognize that there are many fundamental economic and industrial resource needs to achieve and maintain the growth of their economies and they are making the necessary investments in telecommunications, energy, and transportation infrastructure. Labor is relatively cheap in most areas, and the labor climate is stable, when compared to most other regions. Technical skills, however, are frequently in short supply, and nearly all these countries have education and training programs in place to develop internally the skill sets that provide economic advantage.

## Exhibit 1

## 1995 Key Economic Indicators—Asia/Pacific

| Country       | GDP Growth Rate<br>1995 | GDP Growth Rate<br>1996 | Inflation<br>Rate | Unemploy-<br>ment Rate | Exchange<br>Rate |
|---------------|-------------------------|-------------------------|-------------------|------------------------|------------------|
| Australia     | 3.4%                    | 2.8%                    | 5.1%              | 8.2%                   | 1.27             |
| China         | 10.2%                   | 9.8%                    | 15.8%             | 2.9%                   | 8.34             |
| Hong Kong     | 5.0%                    | 5.0%                    | 9.0%              | 1.9%                   | 7.74             |
| India         | 6.3%                    | 6.0%                    | 10.0%             | N/A                    | 35.06            |
| Japan         | 0.9%                    | 2.9%                    | -0.3%             | 3.1%                   | 109.73           |
| New Zealand   | 3.2%                    | 3.5%                    | 1.6%              | 6.4%                   | 1.46             |
| Singapore     | 8.9%                    | 7.5%                    | 1.7%              | 2.6%                   | 1.41             |
| South Korea   | 9.0%                    | 7.6%                    | 5.0%              | 2.0%                   | 811.05           |
| Taiwan        | 6.1%                    | 6.3%                    | 3.7%              | 1.6%                   | 27.51            |
| * Indonesia   | 8.1%                    | 7.8%                    | 9.0%              | 4.0%                   | 2326.60          |
| * Malaysia    | 9.6%                    | 8.7%                    | 3.6%              | 2.8%                   | 2.50             |
| * Philippines | 4.8%                    | 5.4%                    | 10.9%             | 12.0%                  | 26.20            |
| * Thailand    | 8.6%                    | 8.5%                    | 5.8%              | N/A                    | 25.40            |

\* Other Asia/Pacific Countries

Sources: GDP and Inflation - BofA World Information Services, 1996

CIA World Factbook, 1995

Exchange Rate: Wall Street Journal, 6/96

Although there have been long-standing cautions regarding doing business in Asian communities, most foreign businesses now realize that an understanding of cultural and protocol differences is necessary for success in any global market, not just in the Far East and Middle East. There are opportunities for foreign businesses even in highly structured economies such as that of South Korea—where the *chaebols* (Korean trading communities) are strongly entrenched and interconnected to the government, other *chaebols*, and the general business community.

Australia and New Zealand are growing at a slightly slower pace than the rest of this region, but economic opportunity abounds in those nations as well, as New Zealand moves away from its image of an agricultural economy to one of a major “free” economy, similar to Hong Kong and Singapore, and Australia becomes more open to change and new economic opportunity as a result of a movement away from prior conservative, labor-dominated policies. Both countries will continue to be major exporters of agricultural products to the rest of the Asia/Pacific region.

A subtle, but key driver in the growth of this region is the emergence and expansion of the middle class, both as consumers, with a hunger for consumer goods, and as a national resource providing the reservoir of management skills and talents needed for sustained business growth. The general labor force in the developing nations (Other Asia/Pacific) is also becoming more skilled and is no longer just a low-cost, low-skill alternative. Economic and political stability also encourage foreign investment and foreign products and services,

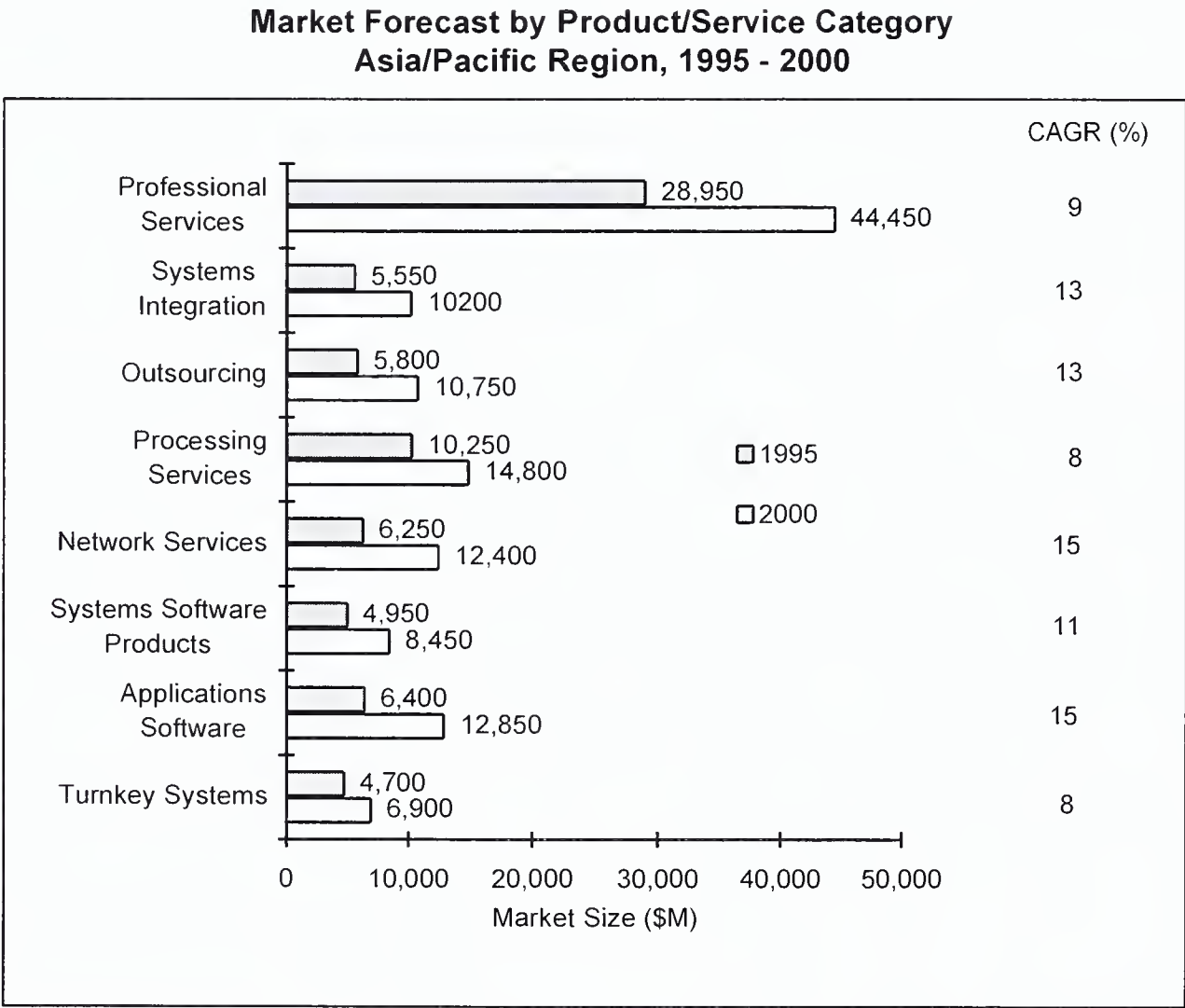


which in turn drive economic growth. And growth and change are the environmental conditions under which information services—a facilitator of growth and change—will continue to flourish.

Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$. A forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2



Numbers are rounded.

Source: INPUT

INPUT forecasts that the Asia/Pacific regional market for information services will grow over the next five years at a rate of 11% per annum—from more than \$72.9 billion in 1995 to just over \$120.8 billion in 2000. This growth is being driven by increased usage in almost all information services areas, but is also the result of the strong 1995-2000 performance of applications software products (a 15% compound annual growth rate),

network services (15% CAGR), outsourcing (13%) and systems integration (13%). The largest product service category, by far, is professional services, which represents 40% of the total regional information services market in 1995, and 37% in 2000. This market, although growing at only a 9% CAGR, is critical to the growth and expansion of the necessary IT resources which will support and facilitate the growth of business and government activities in this region for the next decade. IT consulting to define and guide IT activities, education and training to produce the skills necessary to manage and run the IT infrastructure, and software development to provide the programs necessary to implement new or enhance old applications and systems are all elements of professional services support, and will be resources in high demand during the growth years ahead for this region.

Total information services market growth by country, from 1995 to 2000, is shown in Exhibit 3.

Exhibit 3

**Information Services Market by Country or Country Grouping  
Asia/Pacific Region, 1995-2000**

| COUNTRY OR COUNTRY GROUPING | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|-----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>Regional Totals</b>      | 66,319     | 10%              | 72,904     | 78,972     | 89,619     | 99,038     | 112,093    | 120,827    | 11%            |
| Australia                   | 3,199      | 9%               | 3,495      | 3,851      | 4,268      | 4,754      | 5,317      | 5,951      | 11%            |
| China                       | 249        | 21%              | 301        | 368        | 453        | 564        | 712        | 924        | 25%            |
| Hong Kong                   | 745        | 15%              | 856        | 995        | 1,164      | 1,367      | 1,598      | 1,861      | 17%            |
| India                       | 618        | 31%              | 807        | 1,053      | 1,382      | 1,814      | 2,385      | 3,144      | 31%            |
| Japan                       | 56,152     | 9%               | 61,016     | 64,938     | 72,937     | 79,042     | 87,976     | 91,574     | 8%             |
| New Zealand                 | 1,050      | 11%              | 1,161      | 1,296      | 1,446      | 1,623      | 1,817      | 2,037      | 12%            |
| Singapore                   | 921        | 15%              | 1,056      | 1,210      | 1,389      | 1,602      | 1,858      | 2,160      | 15%            |
| South Korea                 | 2,197      | 28%              | 2,814      | 3,612      | 4,631      | 5,960      | 7,683      | 9,898      | 29%            |
| Taiwan                      | 716        | 16%              | 828        | 961        | 1,117      | 1,301      | 1,515      | 1,769      | 16%            |
| Other Asia/Pacific          | 472        | 21%              | 570        | 688        | 832        | 1,011      | 1,232      | 1,509      | 21%            |

Source: INPUT

Although the region is growing, on average, at an 11% CAGR through the forecast period, this figure is heavily biased by the relatively low growth rate (8%) of the largest market, Japan. Remove Japan from the regional totals, and the other nations are now growing at a 20% CAGR—almost double the growth rate when Japan was included. The greatest opportunities clearly lie in those markets with both a relatively large base and a high growth rate—South Korea, the second largest market in the region and the one with the second highest growth rate (29%); India, with the fourth largest market and the highest growth rate (31% CAGR); and the Other Asia/Pacific nations, with the fourth highest growth rate (21% CAGR) and a small market with great potential. China is a conundrum. With a growth rate of 25% on the smallest information services base in the region, it would

seem to have marginal potential. High growth is what you would expect from a very small starting base. But China is an emerging giant, loved by investors, studied by analysts and served today by a broad range of information services vendors whose investment in market presence does not appear to be justified by current revenues. Why? Because China's economic potential is huge, but still essentially unquantified. And combine China, Taiwan and Hong Kong in the Chinese economic community, and you have a global presence to be reckoned with. Near-term investments in business relationships can be expected to pay handsome long-term dividends.

Exhibit 4 notes the percentages of the Asia/Pacific information services market represented by each of the countries or country groupings, for the years 1995 and 2000. Two scenarios are presented—market share including Japan's dominant presence, and share of market if Japan's spending is not considered. The second analysis allows the effects of the rapidly growing markets to be seen more clearly in terms of relative market share.

Exhibit 4

**Country or Country Grouping Percentages of Total Asia/Pacific  
Information Services Market, 1995 and 2000  
(\$ Billions)**

| COUNTRY                      | % A/P Mkt<br>with Japan | % A/P Mkt<br>with Japan | % A/P Mkt<br>w/o Japan | % A/P Mkt<br>w/o Japan |
|------------------------------|-------------------------|-------------------------|------------------------|------------------------|
|                              | 1995                    | 2000                    | 1995                   | 2000                   |
| <b>Total Info. Svcs. Mkt</b> | \$ 72.9                 | \$120.8                 | \$11.9                 | \$29.3                 |
| Australia                    | 5%                      | 5%                      | 29%                    | 20%                    |
| China                        | -----                   | 1%                      | 3%                     | 3%                     |
| Hong Kong                    | 1%                      | 2%                      | 7%                     | 6%                     |
| India                        | 1%                      | 3%                      | 7%                     | 11%                    |
| Japan                        | 84%                     | 76%                     | -----                  | -----                  |
| New Zealand                  | 2%                      | 2%                      | 10%                    | 7%                     |
| Singapore                    | 1%                      | 2%                      | 9%                     | 7%                     |
| South Korea                  | 4%                      | 8%                      | 24%                    | 34%                    |
| Taiwan                       | 1%                      | 1%                      | 7%                     | 6%                     |
| Other Asia/Pacific           | 1%                      | 1%                      | 5%                     | 5%                     |

*Percentages may not total to 100% due to rounding.*

*Source: INPUT*

Without Japan's information services market included, Australia's share of the non-Japanese market drops from 29% to 20% over the forecast period, and New Zealand's from 10% to 7%. South Korea's share goes from 24% to 34% and India's from 7% to 11%. Some of the changes are obscured by rounding the percentages to whole numbers, as is the case with Hong Kong. Australia and New Zealand's diminished share is not a reflection of any economic weakness; it is simply the result of the rapid growth in spending in other countries with aggressive economic programs.



The fundamental strength of the combined Asia/Pacific economies is shown in the regional performance summarized in Exhibit 3. With the exception of three countries (Australia, New Zealand and Japan), all the information services markets are growing at 15% or better—well above the worldwide average of 12%. There are good opportunities in all countries for all categories of information services, and the countries themselves will benefit from the influx of foreign firms that are providing the skills, experience, and resources to help the Asia/Pacific nations' business communities grow and flourish in domestic and global markets.

## Software and Services Vendors

The following table (Exhibit 5) notes a representative selection of major foreign Asia/Pacific software and services vendors. The listing is representative and is not intended to identify all major vendors. The exhibit indicates whether the primary information services offerings are software, services, or both.

Exhibit 5

### Representative Software and Services Vendors—Asia/Pacific, 1995

| Company Name            | Country of Origin | Offerings             |
|-------------------------|-------------------|-----------------------|
| Andersen Consulting     | United States     | Services              |
| Baan Co. N.V.           | The Netherlands   | Software              |
| CAP GEMINI S.A.         | France            | Services              |
| CSC                     | United States     | Services              |
| Digital Equipment Corp. | United States     | Software and services |
| EDS                     | United States     | Services              |
| Hewlett-Packard         | United States     | Software and services |
| IBM                     | United States     | Software and services |
| Microsoft               | United States     | Software              |
| Novell                  | United States     | Software              |
| NTT                     | Japan             | Services              |
| Oracle                  | United States     | Software              |
| Reuters                 | United Kingdom    | Services              |
| SAP                     | Germany           | Software              |
| Unisys                  | United States     | Software and services |

Source: INPUT

In addition to the sampling of foreign vendors listed, each Asian/Pacific nation has domestic product and services vendors. These are identified in the country-specific profiles for this region.



*Internet Access Vendors* - The Internet offers opportunities for expanded markets, increased business flexibility and, in many cases, reduced costs (when compared to private or dedicated network resources). Businesses in the Asia/Pacific countries (and those in other regions) recognize these attributes and are aggressively exploring the potential of this new communications resource. Concerns regarding Internet security, traffic volumes, access, etc., are near term in nature, are solvable with current technology, and should have no long-term effect on the rapid growth of this exciting new capability. Much of the growth in network services and the planning that takes place in professional services are Internet-related. Each of the Asian/Pacific countries has a number of Internet access providers, with more appearing almost monthly. A listing of these vendors appears in each country-specific profile.

## IT Spending

The following table (Exhibit 6) offers INPUT's estimate of IT spending for the Asia/Pacific region. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product or service.

Exhibit 6

### 1995 IT Spending—Asia/Pacific Region

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 24,700                              | 9                      |
| Internal Staff           | 94,650                              | 33                     |
| Equipment                | 60,050                              | 21                     |
| Equipment Services       | 15,850                              | 6                      |
| Facilities               | 18,950                              | 7                      |
| Information Services     | 72,900                              | 25                     |
| <b>Total IT Spending</b> | <b>287,100</b>                      | <b>100</b>             |

Numbers are rounded

Source: INPUT

As a result of the high labor costs in some nations (e.g., Japan), and the emphasis on core competencies that are driving outsourcing strategies in many Asian/Pacific businesses, the percentage of total IT spending for internal staff has dropped from 37% in 1994 to 33% in

1995. There is a corresponding increase in spending for information services—from 23% of the IT budget in 1994 to 25% in 1995—that is a result of both the shift in some labor costs from internal to external resources and the increasing use of outside skill sets and assets that are in short supply in this region. This trend—increasing use of information services—will continue through the balance of this decade.

The distribution of IT spending for 1995, by country or country grouping, is shown in Exhibit 7. The nation with the preponderance of the IT assets in the Asia/Pacific region is Japan (82%), followed by Australia (5%), South Korea (4%) and New Zealand (2%).

Exhibit 7

#### IT Spending in the Asia/Pacific Region - 1995

| Country                   | Total It Spending<br>(\$ Billions) | Percentage  |
|---------------------------|------------------------------------|-------------|
| Australia                 | 14.6                               | 5%          |
| China                     | 3.0                                | 1%          |
| Hong Kong                 | 3.4                                | 1%          |
| India                     | 3.4                                | 1%          |
| Japan                     | 234.7                              | 82%         |
| New Zealand               | 5.8                                | 2%          |
| Singapore                 | 4.2                                | 1%          |
| South Korea               | 11.3                               | 4%          |
| Taiwan                    | 3.5                                | 1%          |
| Other Asia/Pacific        | 3.4                                | 1%          |
| <b>Total Asia/Pacific</b> | <b>287.1</b>                       | <b>100%</b> |

*Numbers may not total due to rounding.*

*Source : INPUT*

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 8) for Asia/Pacific, for the period 1995-2000.

Exhibit 8

Information Services Market  
Asia/Pacific, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| REGIONAL TOTAL             | 66,319     | 10%              | 72,904     | 78,972     | 89,619     | 99,038     | 112,093    | 120,827    | 11%            |
| Professional Services      | 26,769     | 8%               | 28,963     | 31,254     | 34,704     | 37,856     | 42,090     | 44,435     | 9%             |
| Systems Integration        | 4,956      | 12%              | 5,566      | 6,019      | 6,969      | 7,917      | 9,205      | 10,216     | 13%            |
| Outsourcing                | 5,164      | 12%              | 5,795      | 6,136      | 7,109      | 8,170      | 9,684      | 10,756     | 13%            |
| Processing Services        | 9,304      | 10%              | 10,259     | 10,844     | 12,246     | 13,090     | 14,328     | 14,800     | 8%             |
| Network Services           | 5,574      | 12%              | 6,237      | 6,825      | 7,975      | 9,095      | 10,716     | 12,417     | 15%            |
| Applications SW Products   | 5,581      | 15%              | 6,418      | 7,324      | 8,662      | 9,771      | 11,606     | 12,867     | 15%            |
| Systems SW Products        | 4,497      | 10%              | 4,944      | 5,392      | 6,246      | 6,928      | 7,818      | 8,451      | 11%            |
| Turnkey Systems            | 4,474      | 6%               | 4,722      | 5,178      | 5,708      | 6,211      | 6,646      | 6,885      | 8%             |

Source: INPUT



# Worldwide

## Information Services Program

COUNTRY PROFILE

ASIA/PACIFIC

## Australia

December 1996

### Economic Overview

March 1996 Federal elections in Australia placed a coalition of the National and Liberal parties in power for the first time in 13 years. With the defeat of the Labor Party, it is expected that a more conservative economic agenda will be established for Australia, including privatization of federally owned endeavors, tighter fiscal policies, and additional deregulation of the labor market. Driven by cuts in federal spending to reduce the deficit, Australia's economy is expected to continue to slow down, with real GDP growth declining to 2.8% in 1996 from 3.4% in 1995 and 5% in 1994. An easing of monetary policy is expected as the economy slows, but exports will continue to grow, driven by shipments of agricultural products and manufactured goods—especially to the ASEAN countries. Internal expansion and business expenditures are expected to decline as a result of the economic slowdown, as will consumer spending. Unemployment will hover around 8.2% to 8.3% in 1996, but could rise to as high as 9% as the economy tightens. Key economic indicators for Australia are summarized in Exhibit 1.

Exhibit 1

#### Key Economic Indicators—Australia

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 3.4%  |
| - 1996                   | 2.8%  |
| Inflation Rate (1995)    | 5.1%  |
| Unemployment Rate (1995) | 8.2%  |
| Exchange Rate            | 1.27  |

Sources: GDP and Inflation Data, World Economic Outlook, IMF, 1996  
Exchange Rates, Wall Street Journal, 7/96  
Unemployment Rates, CIA Factbook, 1995



*Business Conditions* - As a result of the tightening of economic controls, business growth in Australia will be tempered somewhat for the next year or so, until the effects of implementing the new conservative Liberal-National coalition's economic policies can be seen. The resistance to change—driven by the labor unions—seen in the prior Labor government should diminish, offering a better chance to succeed for the new economic agendas of tightened fiscal policy, privatization and deregulation of the labor market. A key role in the government will be played by two new agencies—The Australian Competition and Consumer Commission (ACCC) and the National Competition Council (NCC). The ACCC will oversee merger and acquisition activity, while the NCC will review government monopolies (e.g., utilities) and identify opportunities for and facilitate implementation of government privatization activities. In the short term, the activities of both agencies should have a moderating effect on business growth.

## Information Services Market Forecast

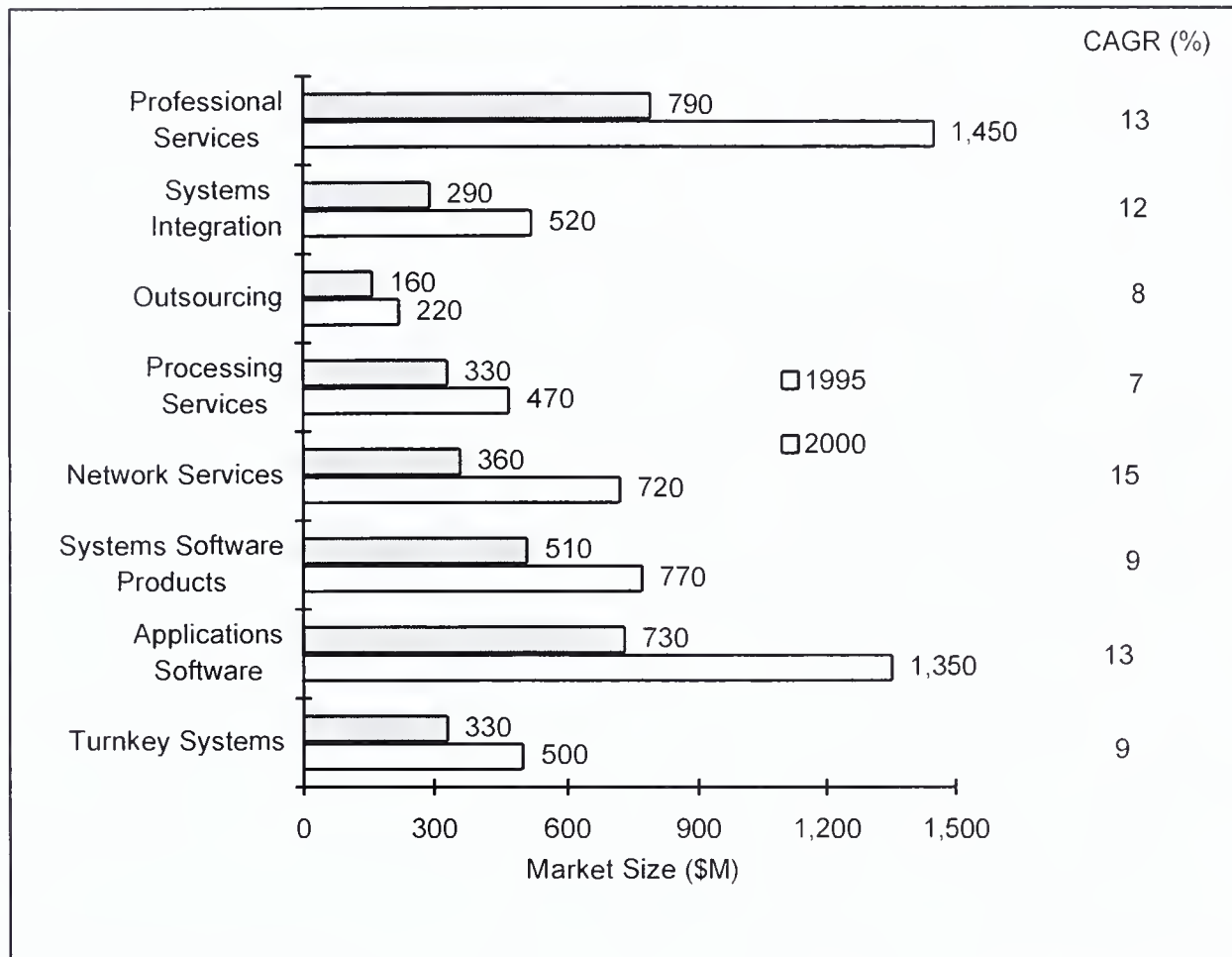
Exhibit 2 summarizes INPUT's market forecast for Australia for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A detailed year-by-year forecast for each product/service category is provided in the Forecast Database section.

Overall, Australia's information services market will grow at an 11% compound annual growth rate (CAGR) through 2000, from \$3.5 billion in 1995 to almost \$6 billion by the millennium. This places Australia's growth at the average (11%) for the Asia/Pacific region for that period, and somewhat ahead of Japan, the largest but slowest growing (8%) market. The average is deceptive, however, since it is so heavily biased by Japan, which dominates the information services market (about 75% of the regional total) in this region. Australia is the third largest market in the Asia/Pacific region, with South Korea second, and at \$6 billion, it will account for 5% of all information services spending in this area in 2000. Countries with similar growth rates include New Zealand (12%) and Singapore (15%). An analysis of the individual information service and product markets follows.

*Professional Services* - Professional services 1995 spending grew at the same level as in 1994 (11%), but will grow at a slightly higher rate (13% CAGR) during the period 1995-2000. This growth is being driven by the steady market for IS consulting resulting from continued emphasis on the use of external industry and technical skills to support the growth of Australian businesses. Software development is the largest segment of the professional services market, and will remain strong through the millennium, as more companies seek outside programming help for company-specific applications development. This will be especially true in the 1998-2000 period as most Australian businesses prepare for the Summer Olympics in Sydney in 2000—a major one-time economic opportunity that will not be ignored by Australian companies.

## Exhibit 2

**Market Forecast by Product/Service Category  
Australia, 1995 - 2000**



Numbers are rounded.

Source: INPUT

*Systems Integration* - Systems integration (SI) spending will show a long-term increase (12% CAGR) as the growing complexity of the business environment motivates more enterprises to seek SI skills to facilitate technological change and support and implement growth initiatives. The professional services subsegment of this market will remain the largest during the 1995-2000 period and will experience the strongest growth, as the continuing shortage of industry and technology skills causes businesses to turn to both professional services firms and systems integrators. Expected to be a strong new player in this market is the recent joint venture between IBM and Lend Lease Corporation, ISSC Australia, Ltd. In addition to SI, ISSC Australia will offer outsourcing, network services and disaster recovery capabilities.

*Outsourcing* - Outsourcing growth will be comparatively slow, but steady (8% CAGR) throughout the forecast period. The large population of PCs and a (now) relatively stable economic environment, coupled with slow but steady business growth—minimizing the

need for processing alternatives with attributes such as cost-cutting and expense control (such as outsourcing)—has caused this segment to see slower growth than has been experienced in the United States or Europe. If the results of tighter economic policies and stronger competition are renewed focus on costs or strong interest in emphasizing core enterprise activities, the rate of growth for outsourcing can increase beyond the 8% currently forecast. A sampling of the Australian outsourcing contracts currently in effect is offered in Exhibit 3. The entries are taken from INPUT's *Outsourcing Contract Database*.

Exhibit 3

### Representative Outsourcing Contracts Currently In Effect in Australia

| Year | Vendor              | Client                                       | Industry       | Value         | Length   |
|------|---------------------|--|----------------|---------------|----------|
| 1995 | Andersen Consulting | Dept. of Planning/Development - Victoria     | Government     | N/A           | 5 years  |
| 1993 | CSC                 | Australian Mutual Provident Society - Sydney | Insurance      | \$1.5 billion | 10 years |
| 1996 | CSC                 | Ampol  | Process Mfg    | N/A           | 3 years  |
| 1994 | EDS                 | South Australia Government                   | Government     | \$600 million | 9 years  |
| 1995 | Unisys              | South Australia Government                   | Government     | \$500 million | 9 years  |
| 1996 | Unisys              | Cathay Pacific Airways                       | Transportation | \$26 million  | 5 years  |

Source: INPUT

*Processing Services* - Processing services growth remains steady at 7%, supported primarily by the ongoing use of transaction processing for pay-as-you-go services such as payroll. "Other" processing services will show an increase during the forecast period as alternative processing activities such as disaster recovery services gain stronger support—especially in view of the highly publicized problems with the reliability and availability of IT support during the 1996 Atlanta Olympics. Overall, processing services are forecast to grow from more than \$330 million in 1995 to \$470 million by 2000.

*Network Services* - There will be strong growth in network services—for both electronic information services (EIS) and network applications. A large part of this growth results from the increasing role that the Internet is playing in Australian business—both as an information source and as a communications alternative (e.g., an "intranet" that can be used by businesses for internal communications such as e-mail). Users now demand instantaneous access to almost any type of data and expect the communications infrastructure to provide this capability. Reflecting the impact of the Internet, EIS and network applications growth are up over last year's figures, with the total network services market growing from more than \$360 million in 1995 to almost \$720 million in 2000—a CAGR of 15%, and the highest growth rate of all product/service categories.



*Systems and Applications Software* - Software products continue their steady growth—applications software at 13% for the five-year forecast period, and systems software at 9%. Emphasis continues to be on PC-based applications and client/server architecture. Many mainframe products now emphasize this platform as an enterprise server, rather than a centralized computing resource. Software products represent 35% of total information services spending in 1995 and will maintain that share in the year 2000. In 2000, the total Australian market for applications software will be almost \$1.35 billion, while systems software products will represent nearly \$770 million in spending. Exhibit 4 notes major industry opportunities for applications and systems software products based upon their installed PC base in 1994. Listing is in descending order of market opportunity.

Exhibit 4

**Australian Industry Opportunities - Software Products**

|                                      |
|--------------------------------------|
| Australian Government                |
| Banking and Finance                  |
| Telecommunications                   |
| Transportation                       |
| Manufacturing (discrete and process) |

Source: U.S. Department of Commerce

*Turnkey Systems* - Turnkey systems growth will remain steady at 9% for the forecast period, with increases in most market subsectors as a result of the growing use by small and mid-sized businesses of application-specific PC platforms for human resources, accounting, and other common business computing activities. Flexible, user-friendly systems will minimize customizing needs, resulting in a slight decrease in spending for turnkey-systems-based professional services. The professional services subsector will still have the highest five-year growth rate (10%), however, because of the continuing client need for design, installation, and implementation support. Hardware costs will remain the largest portion of turnkey spending, and both the hardware and software five-year market growth will be up 2% over the 1994-1995 growth rates, as acceptance of turnkey solutions remains relatively strong in this market.

*The Internet* - As with all of the Asia/Pacific nations, the Internet will have a major impact on the Australian information services market. Developing Internet and intranet solutions for business and government will drive IS consulting and software development activities (professional services) and network services. One of the motivators of a rapid ramp-up of Australian Internet facilities is the fact that, next to the United States, Australia has the second highest number of PCs per capita in the world—all potential clients for Internet-

based products and services. This PC population is expected to grow by 1.2 million units in 1996, further enlarging the base of potential Internet users.

Software and Services Vendors

The following table (Exhibit 5) provides a representative listing of firms providing information services in Australia. The company name, country of origin, and an indication of offerings—software or services—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Data is based upon 1995-1996 information.

Exhibit 5

Representative Foreign Software and Services Vendors—Australia, 1995

| Company Name             | Country of Origin | Offerings                      |
|--------------------------|-------------------|--------------------------------|
| Andersen Consulting      | United States     | Services                       |
| CSC                      | United States     | Services                       |
| Digital Equipment Corp.  | United States     | Software and services          |
| IBM                      | United States     | Software and services          |
| ISSC Australia*          | Australia         | Software and services          |
| Microsoft                | United States     | Software                       |
| Mosaix Technologies, Ltd | Australia         | Software (appl'ns dev't tools) |
| Novell                   | United States     | Software                       |
| Reuters                  | United Kingdom    | Services                       |
| Softway                  | Australia         | Software (Internet firewalls)  |
| Sun Microsystems         | United States     | Software (customized)          |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

\* ISSC Australia is a joint venture between IBM Australia and Lend Lease Corporation.

IT Spending

The following table (Exhibit 6) offers INPUT’s estimate of 1995 IT spending in Australia. Spending is segmented into six categories—data communications, internal staff,

equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the following section, Forecast Database.

---

Exhibit 6

**1995 IT Spending—Australia**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 1,000                                       | 7                             |
| Internal Staff           | 3,500                                       | 24                            |
| Equipment                | 4,100                                       | 28                            |
| Equipment Services       | 1,300                                       | 9                             |
| Facilities               | 1,150                                       | 8                             |
| Information Services     | 3,500                                       | 24                            |
| <b>Total IT Spending</b> | <b>14,450</b>                               | <b>100</b>                    |

*Numbers are rounded.*

*Source: INPUT*

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for Australia, for the period 1995-2000.

## Exhibit 7

### Information Services Market Australia, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 3,199      | 9%               | 3,495      | 3,851      | 4,268      | 4,754      | 5,317      | 5,951      | 11%            |
| <b>Professional Services</b>    | 712        | 11%              | 792        | 886        | 990        | 1,120      | 1,265      | 1,434      | 13%            |
| - IS Consulting                 | 192        | 14%              | 218        | 248        | 280        | 320        | 365        | 415        | 14%            |
| - Education & Training          | 75         | 5%               | 79         | 84         | 90         | 96         | 104        | 114        | 8%             |
| - Software Development          | 445        | 11%              | 495        | 554        | 620        | 704        | 796        | 905        | 13%            |
| <b>Systems Integration</b>      | 261        | 10%              | 288        | 323        | 363        | 406        | 458        | 515        | 12%            |
| - Equipment                     | 112        | 9%               | 122        | 135        | 151        | 169        | 189        | 212        | 12%            |
| - Software Products             | 27         | 11%              | 30         | 33         | 36         | 40         | 45         | 50         | 11%            |
| - Professional Services         | 117        | 11%              | 130        | 147        | 166        | 185        | 210        | 237        | 13%            |
| - Other                         | 5          | 20%              | 6          | 8          | 10         | 12         | 14         | 16         | 22%            |
| <b>Outsourcing</b>              | 145        | 7%               | 155        | 165        | 177        | 191        | 206        | 223        | 8%             |
| - Platform Operations           | 84         | 6%               | 89         | 94         | 100        | 108        | 116        | 125        | 7%             |
| - Applications Operations       | 61         | 8%               | 66         | 71         | 77         | 83         | 90         | 98         | 8%             |
| <b>Processing Services</b>      | 310        | 7%               | 332        | 353        | 377        | 404        | 435        | 470        | 7%             |
| - Transaction Processing        | 264        | 7%               | 283        | 300        | 320        | 343        | 370        | 400        | 7%             |
| - Utility Processing            | 15         | 7%               | 16         | 17         | 18         | 19         | 20         | 21         | 6%             |
| - Other Processing              | 31         | 6%               | 33         | 36         | 39         | 42         | 45         | 49         | 8%             |
| <b>Network Services</b>         | 330        | 10%              | 364        | 410        | 468        | 535        | 622        | 717        | 15%            |
| - Electronic Information Svcs   | 238        | 9%               | 259        | 287        | 322        | 365        | 425        | 490        | 14%            |
| - Network Applications          | 92         | 14%              | 105        | 123        | 146        | 170        | 197        | 227        | 17%            |
| <b>Applications SW Products</b> | 665        | 10%              | 731        | 815        | 921        | 1,041      | 1,176      | 1,328      | 13%            |
| <b>Systems SW Products</b>      | 475        | 7%               | 508        | 544        | 587        | 640        | 700        | 766        | 9%             |
| <b>Turnkey Systems</b>          | 301        | 8%               | 325        | 355        | 385        | 417        | 455        | 498        | 9%             |
| - Equipment                     | 137        | 7%               | 146        | 158        | 170        | 183        | 200        | 220        | 9%             |
| - Software Products             | 71         | 6%               | 75         | 80         | 86         | 93         | 101        | 110        | 8%             |
| - Professional Services         | 93         | 12%              | 104        | 117        | 129        | 141        | 154        | 168        | 10%            |

Source: INPUT





# Worldwide

## Information Services Program

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COUNTRY PROFILE

ASIA/PACIFIC

# China

December 1996

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## Economic Overview

China, as a major economic power, is no longer a sleeping giant. The giant has awakened, and is restless and ambitious. From a comparatively slow rate of growth in the 1980s, the Chinese economy in the 1990s is a vigorous, rapidly expanding entity with opportunities and potential that are attracting investors and businesses from all over the world. Although the U.S. is one of China's major trading partners, it is not the largest—Japan and Hong Kong enjoy that distinction. Other significant trading partners include Taiwan, South Korea, Germany, France, and the United Kingdom. Chinese exports for 1995 totaled \$126 billion, while imports were \$109 billion. Projections through 1998 show a continuation of this favorable trade balance, with exports in that year at \$174 billion and imports at \$165 billion.

Real GDP growth was at 11.9% in 1994 and, although it is expected to decline steadily through 1998 (the latest point for which credible projections are available), growth will still be at a very respectable 9.2% in that year. China's efforts to slow both its too-rapid economic growth and rampant inflation are starting to have an impact, and the pace of the Chinese economy is being reduced to a steady, more sustainable state. Besides persistent inflationary pressures, China also must deal with significant infrastructure problems, a deceptively low rate of unemployment, increasing government budget deficits, increasing social and economic differences between those living in the internal agricultural regions and those in coastal cities, and the ongoing agricultural challenge of feeding the world's largest population.

Unemployment figures are a concern because they are understated—they do not contain the redundant staff in state-owned enterprises or labor surpluses in agricultural areas. If included in published figures, these numbers would double the unemployment figures. A major source of the increase in unemployed is the migration of more people from rural areas to the coastal cities in search of better jobs—the result of a reduction in the restrictions on labor mobility.

Key Chinese economic indicators are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—China

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 10.2% |
| - 1996                   | 9.8%  |
| Inflation Rate (1995)    | 15.8% |
| Unemployment Rate (1995) | 2.9%  |
| Exchange Rate            | 8.34  |

Sources: GDP and Inflation Data, Bank of America, 1996  
Exchange Rates, Wall Street Journal, 7/96  
Unemployment Rates, CIA Factbook, 1995

*Business Conditions* - Business conditions in China are expected to remain positive through the millennium, with a growing emphasis on improving operational efficiencies and increasing use of technology. Recent changes in government policy will favor foreign investments in infrastructure construction and the services sector (to help reduce unemployment through the growth of labor-intensive services). A key point in considering these opportunities, however, is not the size of the market for goods and services, but a realization that China’s business development philosophy is to match business offerings to China’s overall economic development scheme, determine what the product or service can do for China, and then give priority to acquiring the product/industry knowledge, equipment and assistance in developing a domestic capability—rather than importing the final product.

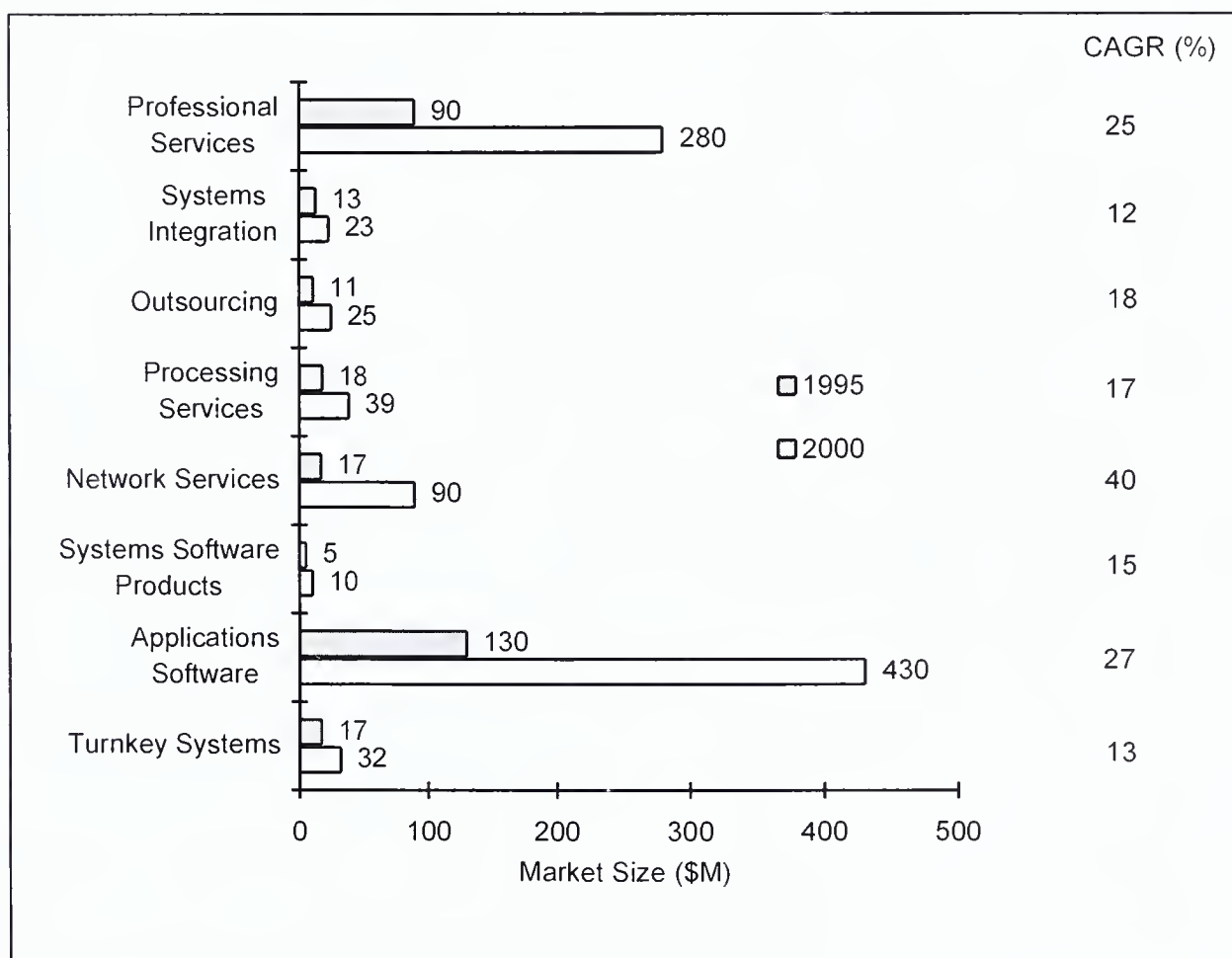
The “hottest” industries in China are utilities (or power production), iron/steel production, electronics and machinery, telecommunications, agricultural and industrial chemicals, and automobile manufacturing. Power production is especially important to China, because increasing sources of energy is necessary to sustain economic growth plans. Current estimates are that China will spend \$80 billion on power and energy development projects by the year 2000. Telecommunications, necessary for both internal business activities and becoming a major player in global markets, will receive \$42 billion in government investments through the year 2000 to upgrade and expand the country’s telecommunications infrastructure.

## Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for China for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
China, 1995 - 2000**



Numbers are rounded.

Source: INPUT

Starting from a relatively small base, the Chinese information services market will grow at a compound annual rate (CAGR) of 25%—from more than \$300 million in 1995 to \$925 million by the year 2000. Growth by product/service category will vary, as noted below.

*Professional Services* - Professional services expenditures, at \$90 million in 1995, are expected to grow at an aggressive 25% through 2000, to nearly \$280 million. The strong growth of this second largest of China's product/service markets is being driven by the need



to modernize and upgrade the information systems and procedures used by both the Chinese government and Chinese businesses in driving the country's strong economic growth. The application of Western methodologies and systems to the support and growth of China's information technology infrastructure benefits both China and the professional services vendors. China gets the advantage of proven methodology, expertise and products to meet its business and technology needs. Vendors, such as Andersen Consulting, sell current services and also establish the relationships so necessary in this culture for strong future growth. Spending is heaviest for IT consulting and software development, with lesser amounts for education and training.

*Systems Integration* - Due to the current lack of size and complexity in the Chinese computer market, the typical benefits of systems integration services—project management, hardware selection and ordering, software implementation—are not realistic needs, and thus there is no significant market for them—or SI. Where such services are required they are supplied by the hardware vendor/manufacturer. However, some Chinese companies are providing SI services (primarily the interconnection of diverse systems) as a separate offering, but in virtually all cases, these firms started out as hardware distributors and established relationships with their SI clients as a result of satisfying their hardware needs. Thus, spending for systems integration (SI) is minimal at this time, and is forecast to grow at a conservative 12% compound annual growth rate (CAGR) through 2000 to \$23 million. The SI figures noted do not include any SI activities bundled with hardware sales by IBM and other hardware manufacturers.

*Outsourcing* - Outsourcing is another area of low current expenditures, primarily due to the level of sophistication of most IT environments. Traditionally, the largest IT market has been the Chinese government, and both economic and cultural concerns for confidentiality limited the use of outsourcers for government production needs. As the competitive business infrastructure now grows in China, confidentiality concerns are still a factor in outsourcing decisions, with the result that growth in this market has been slow. In addition, outsourcing typically becomes a viable alternative as the size and complexity of IT production environments grow—a condition not yet common in the relatively new Chinese IT community.

*Processing Services* - Processing services are typically provided by small local service bureaus on a “pay-as-you-go” transaction-oriented basis. Small to mid-size companies in major metropolitan areas form the business base for these services. At \$18 million in 1995, this product/service market is forecast to more than double by 2000—growing at a 17% CAGR to \$39 million in 2000.

*Network Services* - Network services spending, driven by more access to the Internet, will grow from \$17 million in 1995 to \$90 million in 2000—a CAGR of 40%; the highest of all

Chinese information services product categories. Strongly affecting the use of network services is the fact that China has one of the poorest communications infrastructures of any nation in the world. China has aggressive plans to correct this deficiency, but progress is slow, and the general availability of traditional twisted-pair (copper) communications linkages will be limited, as will business center access to the more sophisticated fiber and other advanced digital technologies preferred for data communications. In the meantime, LANs and a few larger networks are the primary telecommunications resources. LAN growth has been estimated at 40-50% from 1993 to 1994, but this growth is not likely to be maintained. The Chinese government provides access to the Internet via ChinaNet, the state-owned resource, and it is estimated that there are 40,000 Internet accounts in China, all of which are required by law to register with the police. Some 1,000 Chinese databases are available for electronic information service (EIS) access, but only a few of them are used commercially. Although police registration would seem to be a significant impediment to the growth of Internet usage, a more practical one is the cost of the communications-capable PC necessary for Internet access. Such a PC, in today's Chinese hardware market, costs about one year's income for a middle-class Chinese family in which both parents work.

*Systems and Applications Software* - The systems software market is estimated at \$5 million in 1995—a very conservative figure that reflects both the bundling of software with most hardware sales and the high piracy rates for software of all types (see *Software Piracy*, below). Growth is at a conservative 15% through 2000, when the market is forecast to be \$10 million. (The INPUT database upon which the system software market forecast is based is still being expanded and enhanced, and as more details become available and additional analysis conducted for this new country market, it is expected that the size of the systems software market will increase, perhaps as much as two or three times (e.g., in 1995, from a \$5 million market to as much as a \$15 million market), with an increase in growth from a 15% CAGR to 20%. When more data is available, a new forecast will be issued.)

The applications software market, in spite of piracy and some bundling, is at \$130 million in 1995, and forecast to grow to \$430 million in 2000 at a robust CAGR of 27%. There are approximately 1,000 small Chinese software houses, but most applications software used in China still comes from the United States. One factor that will continue to drive the purchase of legal versions of software is the fact that Chinese end users are becoming more sophisticated and are now becoming concerned with receiving software updates and having access to software manuals—both resources that are typically unavailable with pirated software. Major industry opportunities for software developers include banking and finance, energy or utilities, discrete and process manufacturing, telecommunications, and programs used in support of the higher education segment of the education market. Chinese colleges and universities have a strong interest in the application of information



technology to the learning process, although, like the U.S. market, many such institutions prefer to develop applications software using their own internal resources. Because they are the beneficiaries of heavy government subsidization, however, money is available for the “immediate” solutions to educational needs available from U.S. developers.

*Turnkey Systems* - Bundled solutions—as represented by turnkey or “integrated” systems—have found moderate acceptance in the Chinese market. A \$17 million market in 1995, turnkey systems are forecast to grow at a steady 13% CAGR through 2000 to \$32 million. Limiting turnkey systems growth is the increasing availability of small, general-purpose systems and applications software capable of performing both smaller turnkey system functions and other business activities such as word processing, Internet searches, and spreadsheet analysis. However, the growth of China’s manufacturing industry will continue to assure a place for such industry-specific turnkey platforms as numerical control and production process monitoring systems.

*Software Piracy* - Although much of the software piracy occurring in China is simply an attempt to avoid paying for software products (in other words, theft), two other factors have contributed to the problem. The first is China’s historical attitude toward intellectual property. The second factor is the current information technology “culture” in China—that software and services are bundled as part of the hardware purchase. The result of this philosophy and practice is that software and services are perceived as having no separate value (since they are provided “free” with the hardware) and thus the concept of software “piracy” or an infraction of intellectual property rights (IPR) is meaningless. Since software is free it has no price, and copying something with a “zero” value is not stealing and thus not a crime. A U.S. Department of Commerce analysis offered the following summary of the traditional Chinese perspective on this issue:

*Products of intellectual effort have traditionally been considered to be free and in the public domain, so it was difficult to convince purchasers that they should pay Western prices for software. (In the 1980s, the Chinese had) the perception that software did not add value to a computer system. Software often was, and still is, included in hardware sales.*

*In the mid-1990s, there is more money, greater sophistication among consumers, and a growing class of software engineers who stand to gain from a better environment for intellectual property rights protection; but problems remain. The driving force in this market is still low price, and most people still want to pay only a few dollars per program. Because of financial constraints, and the lingering perception that software does not add value, many companies are still unwilling to invest significant sums of money in high-cost programs, and continue to use pirated products. On the bright side, attitudes have slowly begun to change as more legal software becomes available and more Chinese companies produce their own programs, demanding better standards of intellectual property protection.*

Noted in the analysis above is part of the reason why the Chinese information services market is so small in comparison to other that of other nations of similar size (and potential). In addition to the reality that China is just now becoming both economically and politically capable of supporting a sophisticated, business-oriented, information technology environment, and is still in the early stages of IT growth, there is also the fact that bundling hardware, software, and services together as part of a hardware purchase has had the effect of diminishing and obscuring the value of services—just as it did with software. Hardware vendors have been expected to provide any necessary services as part of the support for their hardware products, and there has been little opportunity for outside vendors to break into this market. As with software products, however, perceptions of the value of services are changing, and growth in the services area will reflect this new attitude.

*Industry Opportunity Note* - Running counter to popular opinion, Chinese airlines and banks do see software and services as having a value, primarily due to the international scope of their activities, the need to interface to other systems (reservations, bank clearings), and the heavy volumes of daily international traffic considered normal in these industry segments. Therefore, these two industries offer opportunities for vendors with industry-specific products and services to gain a foothold in the Chinese information services market. In the Chinese government, the Ministry of Aerospace (MA) is starting to consider the use of services. This is important, because the MA acts as an “in-house” vendor to the other Chinese ministries. MA is forming alliances with BayNetworks, Sun and Unisys to provide service offerings. Other ministries are reported to have formed similar relationships with Novell and Daiwoo (South Korea).

**Software and Services Vendors**

The following table (Exhibit 3) provides a representative listing of foreign firms providing information services in China. Because of the ongoing practice of bundling software products and services with hardware sales (thus obscuring the spending for such items), the table also includes major foreign hardware vendors doing business in China, which have software product and service offerings, but for which software/service revenues/offerings have not been specifically identified. The company name, country of origin, and an indication of offerings—software, services, or hardware—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Accordingly, none are offered here. Data is based upon 1995-1996 information.

Exhibit 3

Representative Foreign Software and Services Vendors—China, 1995

| Company Name          | Country of Origin | Offerings                      |
|-----------------------|-------------------|--------------------------------|
| Andersen Consulting   | United States     | Services                       |
| Apple Computer        | United States     | Software, hardware             |
| Compaq                | United States     | Hardware                       |
| EDS                   | United States     | Services                       |
| Hewlett Packard       | United States     | Hardware                       |
| IBM                   | United States     | Software, services, hardware   |
| IPC                   | Singapore         | Services (electronic commerce) |
| Legend Holdings, Ltd. | Hong Kong         | Hardware                       |
| Lotus                 | United States     | Software                       |
| Microsoft             | United States     | Software                       |
| NEC                   | Japan             | Hardware                       |
| NTT                   | Japan             | Services (systems integration) |
| Oracle                | United States     | Software                       |
| Symix                 | United States     | Software                       |
| Unisys                | United States     | Software, services, hardware   |

Sources: INPUT  
U.S. Department of Commerce

As indicated earlier and demonstrated above, U.S. products and services are highly regarded in China, but there are Chinese vendors. Exhibit 4 provides a representative listing of China-based information services providers. Note that hardware sales and software products are key activities, with no services vendors listed. Many China-based companies also have relationships or alliances with foreign firms or act as agents for foreign products. Several of these are noted in Exhibit 5.

Exhibit 4

Representative Chinese Information Services Vendors—China, 1995

| Company Name                        | Offerings          |
|-------------------------------------|--------------------|
| Shanghai Venus Software             | Software           |
| Huadong Computing Science Institute | Software           |
| New Land Software                   | Software           |
| Great Wall Computer Group           | Software, hardware |
| Stone Group                         | Hardware           |

Source: INPUT



## Exhibit 5

**Representative Relationships between Chinese and Foreign Firms**

| Foreign Firm                    | Chinese Partner                                | Type                                       | Name of Joint Venture  |
|---------------------------------|--|--|--|
| Adobe                           | Great Wall                                     | GW can use Adobe as a platform             | (not applicable)   |
| Apple                           | Legend   | Cooperative Agreements                     | (not applicable)   |
| Apple                           | China's Software Park (Zhuhai) Development Co. | Joint Venture                              | Apple-SSP (Zhuhai) Technology Company                                      |
| Compaq                          | (not specified)                                | Joint Venture                              | Calculating Technology Research Institute                                  |
| Hewlett-Packard                 | (not specified)                                | Joint Venture                              | Computer Systems Organization  |
| IBM                             | Tsinghua University                            | Joint Venture                              | Advanced Development Corporation   |
| IBM                             | Jitong Company                                 | Joint Venture                              | Xun Tong Information Networking and Research and Development Company, Ltd. |
| IBM                             | QinhuaSoft                                     | Joint Venture                              | Advanced Systems Development Co.   |
| IBM                             | (not specified)                                | Joint Venture                              | Tianjin Advanced Information Co.   |
| IBM                             | (not specified)                                | Joint Venture                              | Software and Development Co.   |
| IBM                             | (not specified)                                | Joint Venture                              | Shenzhen GKI Electronics Company, Ltd.                                     |
| IBM                             | Great Wall                                     | Joint Venture                              | International Information Production Co.                                   |
| Intel                           | Great Wall                                     | Rights to manufacture Intel's motherboards | (not applicable)   |
| Matsushita, Ltd. Mitsui and Co. | Stone Group                                    | Joint Venture                              | Beijing Stone Matsushita Electric Works, Ltd.                              |
| Microsoft                       | Great Wall                                     | OEM Agreement                              | (not applicable)   |
| NTT                             | Shanghai Venus Software                        | NTT purchased 35% of SVS                   | (not applicable)   |
| Unisys                          | PU Founder Group                               | Chief PC agent in China                    | (not applicable)   |
| Unisys                          | (not specified)                                | Joint Venture                              | Beijing Huayang Operations Company   |
| Unisys                          | China Systems, Ltd.                            | Marketing Agreement                        | (not applicable)   |

Sources: INPUT  
Various Public Records

*Internet Services and Vendors* - Internet access became available in China in February 1995 through SprintLink. Users were linked to the Internet via nodes in Beijing, Shanghai and Shenzhen. In May 1995, ChinaNet became China's initial domestic provider of Internet access, covering 688 Chinese cities with 60,000 terminals. Other new or planned Internet access services include Jitong Communications Co., Ltd. (e-mail, WWW, Telnet service), the State Education Commission, and the China Science Academy. China-on-Line, a Hong Kong-based firm, in conjunction with China's State Bureau of Foreign Experts, is currently offering Internet access to businesses and individual users. The China Internet Corporation (CIC) has provided a solution to the government's political concerns. Based in Hong Kong and 60% owned by the Xinhua News Agency (China's official government news agency), CIC offers a business-oriented Internet environment



with controlled content access to the Western Internet. Long term, despite aggressive attempts to control (and limit) Internet access for individual users, the growth of this resource in the business market will inevitably stimulate its use by individuals for personal computing applications.

## IT Spending

Gathering reliable data on information technology spending by Chinese businesses and government agencies is virtually impossible. In addition to the closed nature of a strongly regimented economy and society, with its restricted access to actual numbers, there is also the traditional Chinese trader’s attitude that information is valuable, and can give one’s business rivals a competitive edge. IT spending data, therefore, has been gathered from a number of sources—INPUT interviews, the U.S. Department of Commerce-ITAA, U.S. vendors serving the Chinese market, and others—and the numbers presented below are INPUT’s assessment of the size of China’s IT market in 1995. It does not include the value of illegal versions of software and other products, or the “not available for competitive bid” spending of private trading groups or government agencies.

The following table (Exhibit 6) offers INPUT’s estimate of 1995 IT spending in China. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the following section, Forecast Database.

Exhibit 6

1995 IT Spending—China

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 90                               | 3                      |
| Internal Staff       | 810                              | 27                     |
| Equipment            | 1,350                            | 45                     |
| Equipment Services   | 210                              | 7                      |
| Facilities           | 240                              | 8                      |
| Information Services | 300                              | 10                     |
| Total IT Spending    | 3,000                            | 100                    |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for China, for the period 1995-2000.

Exhibit 7

### Information Services Market China, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| COUNTRY TOTAL              | 249        | 21%              | 301        | 368        | 453        | 564        | 712        | 924        | 25%            |
| Professional Services      | 75         | 20%              | 90         | 111        | 136        | 170        | 215        | 275        | 25%            |
| Systems Integration        | 12         | 8%               | 13         | 14         | 15         | 17         | 20         | 23         | 12%            |
| Outsourcing                | 10         | 10%              | 11         | 13         | 15         | 18         | 21         | 25         | 18%            |
| Processing Services        | 15         | 20%              | 18         | 21         | 25         | 29         | 34         | 39         | 17%            |
| Network Services           | 12         | 42%              | 17         | 24         | 33         | 47         | 65         | 90         | 40%            |
| Applications SW Products   | 105        | 24%              | 130        | 160        | 200        | 250        | 320        | 430        | 27%            |
| Systems SW Products        | 5          | 0%               | 5          | 6          | 7          | 8          | 9          | 10         | 15%            |
| Turnkey Systems            | 15         | 13%              | 17         | 19         | 22         | 25         | 28         | 32         | 13%            |

Source: INPUT





# Worldwide

## Information Services Program

COUNTRY PROFILE

ASIA/PACIFIC

## Hong Kong

December 1996

### Economic Overview

On July 1, 1997, Hong Kong becomes a "Special Administrative Region" (SAR) of China. After many years under British government, absorbing Western culture and growing to a major economic and financial power in the Asia/Pacific region, one of the most vital business centers in the Far East is returning to Chinese control. The initial concerns that this change would be devastating to Hong Kong's business capabilities—driven by fears that China's ideological conservatism would engulf and destroy Hong Kong's free-wheeling entrepreneurial style—led to a mass exodus of individuals and individual and business assets. At one point there were concerns that the exodus was creating such a severe strain on Hong Kong's key human and financial resources that irreparable damage would be done.

Not to worry. Although North American coastal cities with strong Chinese communities—such as Vancouver, B.C. and San Francisco—saw an influx of Hong Kong professionals, the majority of the Hong Kong business community has waited to see signs of significant changes in the way Hong Kong will be governed or business will be conducted. To the surprise of many observers, China has provided strong signals that Hong Kong is a "golden goose" that it does not intend to endanger in any way. China has recognized that Hong Kong's huge foreign investment base offers many opportunities as:

- A source of investment in China's increasing "capitalistic" business activities and economic growth
- A gateway to and from China for tourists, traders and investors
- An established and sophisticated outlet for Chinese goods and a recognized and stable staging point for goods entering China

For the moment, and certainly well through the millennium, Hong Kong's future appears bright. In addition to the growing number of Western companies that find Hong Kong a comfortable place from which to do business in Asia (especially with China), Chinese



companies increasingly use Hong Kong’s highly developed communications, financial, marketing and air travel access facilities to conduct business, while actual Chinese production facilities are being concentrated in Southern China where costs are lower.

Key economic indicators for Hong Kong are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—Hong Kong

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 5.0%  |
| - 1996                   | 5.0%  |
| Inflation Rate (1995)    | 9.0%  |
| Unemployment Rate (1994) | 1.9%  |
| Exchange Rate            | 7.74  |

Sources: GDP and Inflation Data, World Economic Outlook, IMF, 1996  
Exchange Rates, Wall Street Journal, 7/96  
Unemployment Rates, CIA Factbook, 1995

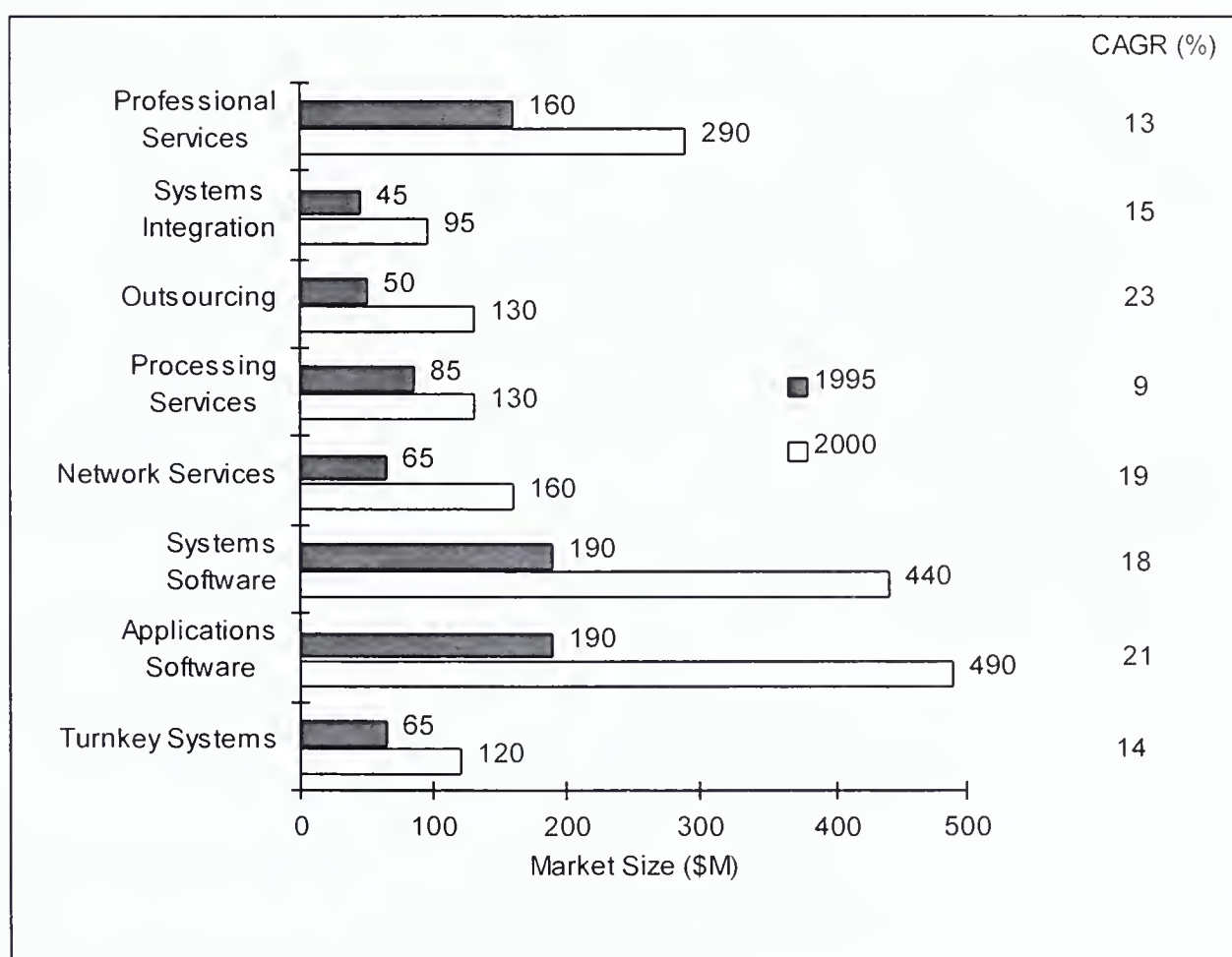
*Business Conditions* - Business conditions should remain good as Hong Kong, with China’s support, assumes the position of second largest financial center in Eastern Asia, after Tokyo. Other financial centers such as Taipei, Singapore and, eventually, Shanghai, suffer from impediments such as distance from other Asian markets (Singapore), excessive regulation (Taipei), or long delays in building an adequate infrastructure (Shanghai). On the average, one-third of China’s exports and a quarter of its imports flow through Hong Kong. Business benefits from Hong Kong’s economic policies of noninterference in commercial activities, a stable government that keeps spending within the bounds of revenues, low taxes and laws regarding competition that are openly and consistently enforced (see *Software Piracy*). Key business sectors that will see continued growth in the near term include insurance, and banking and finance. With almost two-thirds of Hong Kong’s population employed in services industries—and generating three-quarters of the country’s GDP—the telecommunications, wholesale and retail trade sectors will also grow. As manufacturing employment decreases, with shifts to other countries with lower labor rates, such as China, spending in the discrete and process manufacturing sectors will also decrease.

## Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for Hong Kong for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A detailed year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
Hong Kong, 1995 - 2000**



Numbers are rounded.

Source: INPUT

The market for information services in Hong Kong was more than \$850 million in 1995, and will grow to over \$1.8 billion by 2000—at a compound annual growth rate (CAGR) of 17%. Specific product/service markets are analyzed in the following paragraphs.

*Professional Services* - As Hong Kong companies maneuver to take advantage of this economy's strong position in the Asia/Pacific market, the need for skilled professional services for IS restructuring or expansion will grow. INPUT forecasts a steady 13%

compound annual growth rate (CAGR) for this service category with strong growth in both the IS consulting (15%) and software development (12%) activities. Although U.S. packaged software dominates this market, the competitive nature of the financial activities of banks, trading companies, insurance firms and others requires unique, proprietary software to meet specific business demands and provide, where possible, competitive advantage. The growth of education and training activities will diminish as Hong Kong's extremely well-educated and -trained population acquires more computing skills as part of normal higher education and business training activities.

*Systems Integration* - In the global, networked, distributed world, companies that can't change to meet the current information and response needs of their competitive environment are doomed. Hong Kong, a sophisticated business community, recognizes this truism, and is implementing and facilitating change through the use of systems integrators. Major international players (such as IBM, Digital, EDS, Hewlett-Packard, and Unisys) and local companies (including Hongkong Telecom CSL, Vannet, Chevalier and Datacraft) recognize this and are providing systems integration (SI) services to this market. Major SI activities include expanding communications capabilities, integrating diverse systems, and implementing enhanced distributed systems or client/server architecture. INPUT projects the overall growth of the SI market at a 15% CAGR through 2000, with most expenditures for equipment and professional services. Software product sales are relatively low (with the 22% CAGR resulting from the small base, rather than a large market) because most SI contracts are for critical resource support or enhancement, frequently involving proprietary software that provides competitive advantage. Such software is not purchased, but developed either under an SI contract or outside of, but in coordination with it.

*Outsourcing* - Outsourcing is growing as more companies seek to minimize risks by using outsourcers as a way of dealing with increasing manpower and equipment needs without making internal capital investments. It is also a way of offloading to a third party some of the risks and uncertainties of the Hong Kong business environment after July 1, 1997. EDS, for instance, a major global outsourcer, entered into two recent outsourcing contracts in Hong Kong; one with CargoNet (telecommunications industry) in 1996, and another with Rank Xerox-Hong Kong (discrete manufacturing) in 1996. Both were for applications operations management. Because of the sophistication of the Hong Kong market, INPUT expects to see a 23% compound annual growth in spending for outsourcing through 2000. The largest base is that of contracts for traditional platform operations—a market that will grow at a 22% rate through the millennium. Applications operations, although currently less than half the size of the platform operations market, will become more popular (as evidenced by the EDS contracts noted above), and will grow at a 24% CAGR for the next five years. Other outsourcing activities such as desktop services, network management, applications management and business operations outsourcing (separate outsourcing



categories measured in the U.S.) will also become more significant and further drive this market.

*Processing Services* - The processing services market will grow at a steady 9% through 2000, from \$85 million in 1995 to more than \$130 million at the millennium. The strongest growth (14%) will be from a small base of \$14 million in 1995 for utility processing, as Hong Kong firms and China-based firms with offices in Hong Kong use this incremental cost resource for production work until costs justify dedicated installations. The largest processing services subsector—transaction processing—will grow at a more conservative 8%, to \$88 million in 2000. This conservative growth reflects the value of transaction-based services to a major global financial center. Hongkong Telecom will spend a billion U.S. dollars over the next ten years building a video-on-demand (one of the first to be implemented anywhere) and consumer services system delivered via cable. The first services will be available in 1997. The system will use a TV-top decoder with installed Java chips and C++ media servers for service delivery. The impact of this new delivery mechanism for home shopping and banking transactions is as yet unknown, but if successful, the new transaction-based activities will be additive to the transaction processing expenditures (e.g., for VISA clearings) noted in this forecast.

*Network Services* - Driven by the Internet, the communications needs of sophisticated global banking activities, and the growing importance of telecommunications to the new business IT paradigm (distributed processing and client/server architecture), it is no surprise that network services are growing at an aggressive 19% CAGR through 2000, to a market of nearly \$160 million. Network applications, such as value-added networks and EDI, will grow at a slightly more aggressive 20%, with the market increasing from \$37 million in 1995 to \$91 million in 2000. This growth anticipates that Hong Kong's troubled EDI service, Tradelink, will eventually resolve its financial difficulties, receive the needed capital to complete its implementation (probably late in the forecast cycle), and provide a viable EDI service that can be used in Hong Kong's major export markets. Tradelink is 52% privately owned, with the balance of the shares held by the government. The electronic information services (EIS) market, driven by the steadily increasing number of Internet-based applications, will grow at a 19% CAGR, with a total market of \$66 million in 2000.

*Systems and Applications Software* - Combined, systems and applications software will represent almost exactly half of Hong Kong's total spending on information services in 2000. The applications software market will grow from a \$190 million market in 1995 to \$490 million in 2000—a CAGR of 21%. Systems software will grow from about \$190 million to \$440 million in the same period—an 18% CAGR. In 1995, the total software products market represented 45% of information services spending in Hong Kong. This share will grow to 50% in 2000. As in most Asia/Pacific nations, U.S. software products are



extremely popular and in this English-speaking territory, this is especially true. Large platform operating system software is dominated by manufacturers' offerings, such as those provided by Digital and IBM. PC/workstation platform operating systems are predominantly Microsoft, and familiar names such as Informix, Oracle and Sybase are major players in the database management system (DBMS) market.

Mainframe users tend to be large financial institutions or the larger trading companies, many of which are using or have inherited legacy systems in need of updating to a network-intensive distributed environment. PC users are ubiquitous and their number is growing rapidly—in fact, most firms in Hong Kong (other than the large financial institutions or trading companies) have less than 50 employees and use PCs for their computing needs. Popular platforms include Apple, AST, Compaq and IBM, with Acer, Hewlett-Packard, Packard Bell, and others also active participants. Even Dell has a telemarketing operation serving the Hong Kong market. Multimedia is a key application area, primarily due to its use in Hong Kong's extremely active entertainment industry—and especially for television and movie production. Although English is the accepted language in Hong Kong, the extremely strong Chinese community also offers a market for Chinese script applications and environments (such as Windows). Seeing this opportunity, both Lotus and IBM offer Chinese-language versions of their key products. With China's presence increasing on July 1, 1997, Chinese script versions of vendor software products offer an opportunity to increase market share.

*Turnkey Systems* - Turnkey systems continue to be a popular solution to many Hong Kong user applications needs, and this market will grow from over \$60 million in 1995 to more than \$120 million in 2000. The 14% CAGR is being driven by even growth in all turnkey areas—equipment, software products, and professional services. The turnkey share of Hong Kong's total information services market will drop by a full percentage point, to 6.6% in 2000, as other areas, such as outsourcing, software products and network services assume larger roles in this market. After the millennium, spending in this sector should start to decrease as increasingly flexible general-purpose systems and enhanced network capabilities offer viable alternatives to the industry- or application-specific offerings now sold as turnkey systems.

*Software Piracy* - The stated role of the Hong Kong government is to facilitate industrial and trade activities within the framework of a free market. It neither subsidizes nor protects business activity. Within this context, however, the government recognizes a responsibility to provide an acceptable working infrastructure. For computer software, strong intellectual property rights (IPR) have been in effect for a number of years and will remain in place through the middle of the next century. China has recently implemented similar IPR laws, but has not been aggressive in enforcing them. Hong Kong not only prosecutes piracy offenders, it is also actively working to make certain that its laws assure

compliance with GATT/WTO responsibilities. Penalties for violation of producing illegal software copies include a maximum of two years imprisonment and fines up to HK\$50,000. If you are *using* illegal copies of software, you can be fined up to HK\$1,000 per copy and spend up to one year in jail. In the words of Hong Kong Judge Pang, “Hong Kong has no intention whatsoever of becoming a safe haven for people who engage in the manufacturing and selling of pirated material.”

*Financial Industry Opportunity Note* - The financial services industry, including banks and insurance companies, is the most important Hong Kong market. The majority of the software needs of this market are met through the purchase of imported products—mostly from the United States. Quality is a key issue in vendor selection, as is after-sale service and the financial viability of the vendor. Hong Kong information services buyers want to do business with companies committed to serving their market area. Relationships tend to be long term and the buyer wants to be certain the vendor will be there when the next need arises. Service is also an important factor in sales. Although many users buy off-the-shelf software products, it is a common practice for vendors to modify packages for large users in the banking/financial services market to meet specific client needs. Functionality is the most important product attribute, and mid-size and small businesses prefer software that is user friendly and can grow as the user’s needs increase. Popular financial applications, for which there is strong market opportunity, include basic accounting packages (especially for PCs), multicompany and multicurrency software, software that provides Chinese-character capability, and niche applications for the banking industry.

*The Internet* - As of late 1995, there were more than 30 licensed Internet service providers in Hong Kong. Hong Kong’s sophisticated telecommunications infrastructure and its “hands off” attitude (unlike China’s) toward legitimate trade activity and data access, coupled with the aggressive commercialism of Hong Kong’s business communities and its ties to all corners of the world, guarantee that the benefits of Internet access, especially to the financial and trading communities, will be exploited to the utmost.

## Software and Services Vendors

The following table (Exhibit 3) provides a representative listing of foreign firms providing information services in Hong Kong. The company name, country of origin, and an indication of offerings—software, services, or both—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Accordingly, none are offered here. Data is based upon 1995-1996 information. As indicated earlier and demonstrated below, U.S. products and services are highly regarded in Hong Kong.

After Hong Kong becomes a “Special Administrative Region” (SAR) of China in 1997, it is expected that major Chinese software companies such as Shanghai Venus Software, New Land Software and the Great Wall Group will establish a Hong Kong presence. Since Hong Kong has little internal software development activity, and since foreign software is preferred by both China and Hong Kong, foreign vendors will continue to find a strong market for their products in this region.

Exhibit 3

Representative Foreign Software and Services Vendors—Hong Kong, 1995

| Company Name            | Country of Origin | Offerings                      |
|-------------------------|-------------------|--------------------------------|
| Andersen Consulting     | United States     | Services                       |
| Chevalier               | Hong Kong         | Services                       |
| CSC                     | United States     | Services                       |
| Datacraft               | Hong Kong         | Services                       |
| Digital Equipment       | United States     | Software, services             |
| EDS                     | United States     | Services                       |
| Hewlett-Packard         | United States     | Services                       |
| Hongkong Telecom        | Hong Kong         | Services                       |
| IBM                     | United States     | Software, services             |
| Informix                | United States     | Software                       |
| Lotus Development Corp. | United States     | Software                       |
| Microsoft               | United States     | Software                       |
| NTT                     | Japan             | Services (systems integration) |
| Oracle                  | United States     | Software                       |
| Reuters                 | United Kingdom    | Services                       |
| Symix                   | United States     | Software                       |
| Unisys                  | United States     | Software, services             |
| Vannet                  | Hong Kong         | Services                       |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

## IT Spending

The following table (Exhibit 4) offers INPUT’s estimate of 1995 IT spending in Hong Kong. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are



shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the following section, Forecast Database.

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Exhibit 4

**1995 IT Spending—Hong Kong**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 310   | 9                             |
| Internal Staff           | 1,150                                       | 34                            |
| Equipment                | 690   | 20                            |
| Equipment Services       | 170   | 5                             |
| Facilities               | 240   | 7                             |
| Information Services     | 860   | 25                            |
| <b>Total IT Spending</b> | <b>3,400</b>                                | <b>100</b>                    |

*Numbers are rounded.*

*Source: INPUT*

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for Hong Kong, for the period 1995-2000.



Exhibit 5

Information Services Market  
Hong Kong, 1995-2000

| PRODUCT/SERVICE CATEGORIES    | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|-------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| COUNTRY TOTAL                 | 745        | 15%              | 856        | 995        | 1,164      | 1,367      | 1,598      | 1,861      | 17%            |
| Professional Services         | 146        | 11%              | 162        | 183        | 207        | 232        | 259        | 292        | 13%            |
| - IS Consulting               | 39         | 15%              | 45         | 52         | 61         | 70         | 80         | 91         | 15%            |
| - Education & Training        | 13         | 8%               | 14         | 15         | 16         | 17         | 17         | 18         | 5%             |
| - Software Development        | 94         | 10%              | 103        | 116        | 130        | 145        | 162        | 183        | 12%            |
| Systems Integration           | 41         | 11%              | 46         | 52         | 58         | 67         | 79         | 93         | 15%            |
| - Equipment                   | 19         | 11%              | 21         | 25         | 28         | 32         | 38         | 44         | 16%            |
| - Software Products           | 4          | 10%              | 4          | 5          | 5          | 6          | 8          | 11         | 22%            |
| - Professional Services       | 15         | 13%              | 17         | 19         | 21         | 25         | 28         | 33         | 14%            |
| - Other                       | 3          | 10%              | 3          | 3          | 4          | 4          | 5          | 5          | 11%            |
| Outsourcing                   | 39         | 23%              | 48         | 59         | 73         | 90         | 110        | 134        | 23%            |
| - Platform Operations         | 24         | 25%              | 30         | 37         | 45         | 55         | 67         | 81         | 22%            |
| - Applications Operations     | 15         | 20%              | 18         | 22         | 28         | 35         | 43         | 53         | 24%            |
| Processing Services           | 80         | 6%               | 85         | 92         | 99         | 108        | 119        | 131        | 9%             |
| - Transaction Processing      | 58         | 5%               | 61         | 66         | 71         | 77         | 82         | 88         | 8%             |
| - Utility Processing          | 13         | 8%               | 14         | 15         | 17         | 19         | 23         | 27         | 14%            |
| - Other Processing            | 9          | 11%              | 10         | 11         | 11         | 12         | 14         | 16         | 10%            |
| Network Services              | 55         | 18%              | 65         | 77         | 92         | 110        | 131        | 157        | 19%            |
| - Electronic Information Svcs | 24         | 17%              | 28         | 33         | 39         | 46         | 55         | 66         | 19%            |
| - Network Applications        | 31         | 19%              | 37         | 44         | 53         | 64         | 76         | 91         | 20%            |
| Applications SW Products      | 162        | 19%              | 192        | 230        | 278        | 340        | 410        | 490        | 21%            |
| Systems SW Products           | 165        | 18%              | 194        | 230        | 275        | 325        | 380        | 440        | 18%            |
| Turnkey Systems               | 57         | 12%              | 64         | 72         | 82         | 95         | 110        | 124        | 14%            |
| - Equipment                   | 27         | 15%              | 31         | 34         | 39         | 45         | 52         | 59         | 14%            |
| - Software Products           | 13         | 8%               | 14         | 15         | 17         | 20         | 24         | 28         | 15%            |
| - Professional Services       | 17         | 12%              | 19         | 23         | 26         | 30         | 34         | 37         | 14%            |

Source: INPUT



# Worldwide

## Information Services Program

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COUNTRY PROFILE

ASIA/PACIFIC

## India

December 1996

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### Economic Overview

The economic reforms initiated in 1991 continue to bring positive results. Reforms included reducing government subsidies and spending, liberalizing foreign trade, relaxing industrial regulations, encouraging foreign investment, lessening exchange controls, and devaluing the rupee. The World Bank notes that the “reforms could enable India to grow at the rates experienced by its successful East Asian neighbors.” But P. Chidambaum, India’s Minister of Commerce, cautioned, “India’s road to reform will be neither a German Autobahn nor an American interstate. We’ll take an Indian road—with potholes, twists and turns, and slowing down at crossings .... we will reach our goal.”

The strong economic momentum seen in 1995 is expected to carry over into 1996, with real GDP growth at a stable 6.0% to 6.3% for the period 1994 to 1998. Inflation will drop from 11.3% in 1994 to 9.5% by 1998 as the effects of tighter monetary controls continue to be felt. Exact figures for unemployment are not available, but though the economic expansion of India and the growth of the private sector has led to many new jobs, this trend has been tempered by the country’s restrictive labor laws that make downsizing (if necessary) and the dismissal of redundant workers difficult. The net effect of these labor and economic realities is a conservative growth in the labor force as new or expanding businesses seek to maintain minimal labor forces as a cautionary move. Excessive labor levels in the public sector is another problem, but most observers feel that India’s labor problems are not likely to be addressed until 1998. Balancing the negative aspects of the labor issues is the rich mix of skilled professionals in the labor force—almost 3.5 million scientists, engineers, and technical and medical professionals—that forms the knowledge/skill infrastructure necessary for sustained economic growth. With government support, Indian colleges and universities continue to turn out large numbers of IT professionals and India has become a major resource for both offshore custom programming and software product development.

Key economic indicators for India are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—India

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 6.3%  |
| - 1996                   | 6.0%  |
| Inflation Rate (1995)    | 10.0% |
| Unemployment Rate (1995) | N/A   |
| Exchange Rate            | 35.06 |

Sources: GDP and Inflation Data, BofA World Information Services, 1996  
Exchange Rates, Wall Street Journal, 7/96

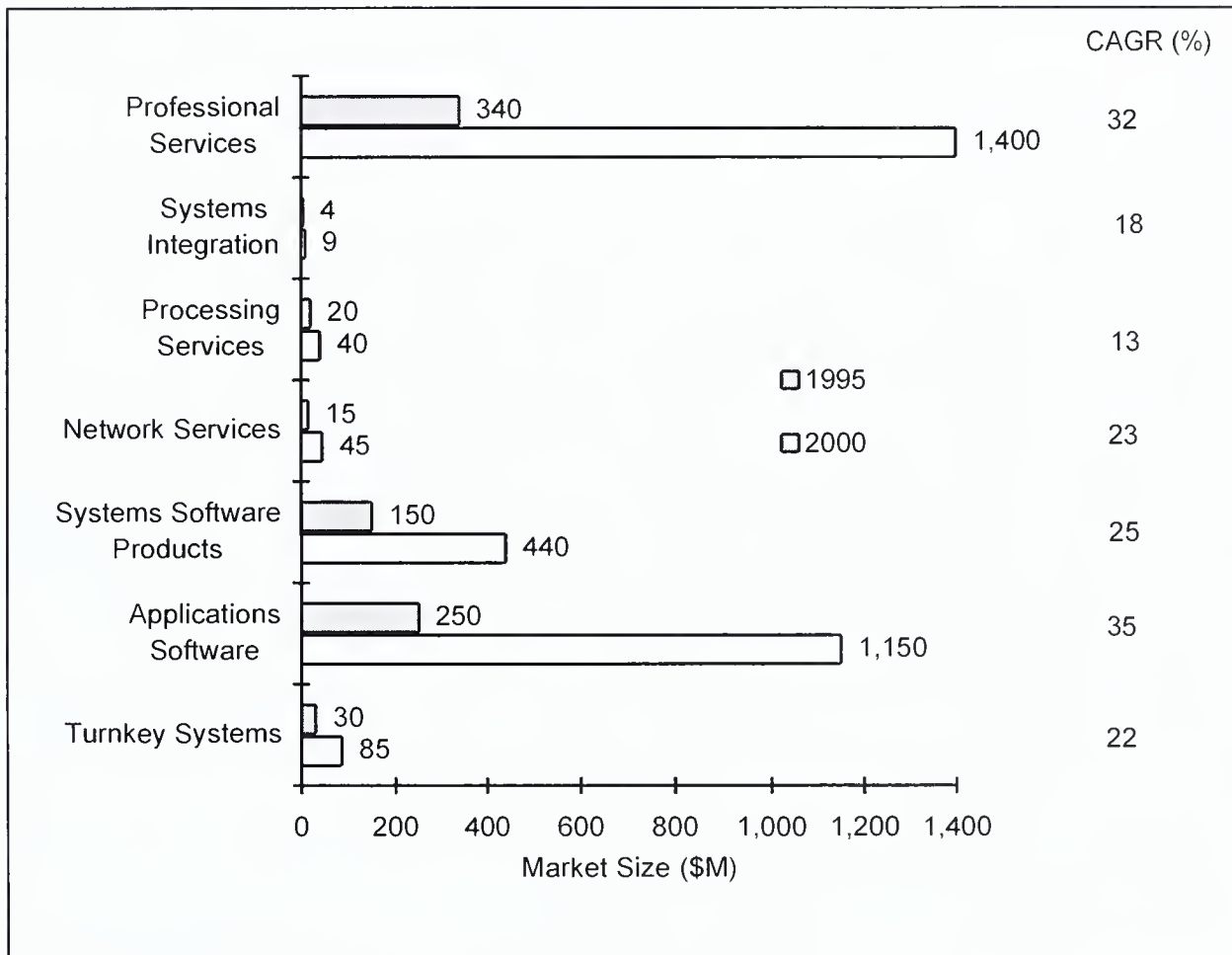
*Business Conditions* - Due to the continuing growth of its economy, India’s business climate will remain favorable through the millennium. Corporate profits, driven by growing sales to both business and the burgeoning population of middle-class consumers, will continue at high levels. High interest rates, coupled with tight credit, will dampen the growth somewhat, but foreign investment—in response to government reforms—should continue to increase. Red tape, a traditional problem in the Indian government, will continue to be an issue, but the realities of India’s needs and huge potential will continue to attract foreign dollars. More than 200 U.S. firms now have equity investments in India, mostly concentrated in the business centers of Bombay, New Delhi, Bangalore and Madras.

Information Services Market Forecast

Driven by economic growth and acceptance as a major offshore programming/software resource, India’s information services market will grow from more than \$800 million in 1995 to nearly \$3.2 billion in 2000—a compound annual growth rate (CAGR) of 31%. Exhibit 2 summarizes INPUT’s market forecast for India for the seven information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

### Market Forecast by Product/Service Category India, 1995 - 2000



Numbers are rounded.

Source: INPUT

*Professional Services* - Professional services growth is forecast at a dramatic 32% CAGR from 1995 to 2000. This growth is being driven by the IT consulting, education and training, and custom software development activities necessary to support India's rapidly growing business community. The major portion of the expenditures for professional services is for IS consulting activities aimed at planning for and facilitating the growth of the internal IT resources of Indian enterprises—resources that are necessary to the conduct of both domestic and international business activities—and to manage and grow the infrastructure of India's highly successful offshore software development industry. (The revenues to Indian software firms from offshore client purchases or contracts are not included in this forecast, since they are for software customers (and markets) in other countries.) As India's business community responds to the aggressive growth forecast for this economy through the millennium, there will be a constant need for the top-level technical skills necessary to remain competitive in the global marketplace. Because the labor laws are not expected to change before 1998 or later, there will be an ongoing



motivation to hire scarce, high-cost, technical skills by the hour (or under contract), rather than incorporate them into a business' labor force—with its attendant burdened costs and the risk of not being able to change the composition of internal staff quickly because of restrictions on layoffs. By 2000, 1995's \$340 million professional services market will grow to almost \$1.4 billion—a CAGR that is exceeded only by the rapidly growing Indian market for applications software.

*Systems Integration* - Systems integration (SI) activities in India are quite limited and are conducted primarily in two major areas: adding to, consolidating or expanding the IT resources of growing companies and tying together and managing the distributed PC-based resources used by most Indian companies. SI projects may include designing and implementing distributed processing environments and some use of client/server architecture. Another area that will grow in importance is the design, integration and implementation of the PC-based videoconferencing resources becoming more popular as a means of travel-free face-to-face meetings between companies that are geographically separated. From a small base of \$4 million, this market will grow to \$9 million by 2000. Higher growth rates are possible if joint ventures, collaborative efforts, or business relationships between Indian vendors and foreign clients require interfaces to or integration with existing complex systems or large-scale processing environments. This is unlikely in the near term, but will be a growth stimulator after the millennium as the needs of the global market require more complex telecommunications and processing interconnections.

*Processing Services* - Transaction processing services form the bulk of spending for this product/service category, with some minor use of outside processing resources for overflow production activity. The market is small because so much of the business processing activity is conducted on internal workstation/PC platforms, with additional resources available through a client/server or LAN-interconnected environment. Primary applications are banking- and finance-oriented, including demand deposit and credit card clearings. A moderate 13% CAGR is forecast for this service area, and much of this growth will be driven by reduced unemployment (more paychecks), the growth of the consumer market (more purchases providing more check and credit transactions) and the increasing availability of goods and services to buy (a function of increased imports and relaxed government controls).

*Network Services* - India has a relatively undeveloped telecommunications infrastructure, in part due to a long period of economic stagnation in the 1980s in which half the population was below the poverty level. Strong economic gains have been made and India's industrial base (heavy machinery, chemicals, cement, coal, steel, textiles) is growing. India is self-sufficient for food production and is a net exporter of grain. But these areas, albeit growing and improving from past states, have not driven the growth of the Indian

manufacturing industry segments. As PCs provide more cost-effective alternatives to dedicated single-purpose platforms, the growth of this market will decline, but that will occur after the millenium and, until then, this market will continue to see strong growth—especially as the impact of the Internet begins to be felt and service providers install turnkey Internet platforms in this market.

Exhibit 3

**Key Indian Industry Segment Markets for Software Products**

- Government (Energy, Utilities, Transporatation)
- Banking and Finance
- Discrete Manufacturing (Machine Tools)
- Process Manufacturing (Steel, Chemicals)
- Utilities (Gas, Electricity)
- Business Services (Software Development)

Source: INPUT

*The Internet* - In India, Internet access is provided by aXcess On-line Services, Calport Technologies, ERNET, INDIALINK BOMBAY, INDIALINK DELPHI, Online Services, Pharos Infotech, UUNET India Limited, and Videsh Sanchar Nigam Limited (VSNL), among others. The sophistication of the IT professionals in India, and the familiarity of many businesses and individuals with India’s many e-mail services, will provide a catalyst for continuing Internet growth.

**Software and Services Vendors**

The following table (Exhibit 4) gives a representative list of firms providing information services in India. The company name, country of origin, and an indication of offerings—software or services—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Data is based upon 1995-1996 information.

telecommunications environment as much as they might have. Government-owned telecommunications equipment and service providers dominated this market (with a 90% share) until the last few years, and only recently have privatization, relaxed tariffs and other incentives encouraged the participation of foreign investment to improve the communications environment. All telecommunications expenditures for India totalled approximately \$6.5 billion in 1995, with slightly less than half for telecommunications services. Electronic information services are limited but growing, as is the development of network resources such as value-added networks (VANs). The growth of network services will be strong at a 23% CAGR for the forecast period, but the market is moving from a very small base of \$15 million to almost \$45 million in 2000. The effect of the Internet is at the moment unknown, but given the growing population of PCs, the familiarity of many users with India's established e-mail service, and the almost infinite possibilities of the Internet itself, it will be a factor in future Indian telecommunications growth.

*Systems and Applications Software Products* - If you are an IT professional, when you think of India you think of software, because India is a major supplier of custom software and software products to the world. India is also a strong consumer of software products. The Indian software market will grow from nearly \$400 million in 1995 to almost \$1.6 billion by 2000—a CAGR of 32%, equal to the growth rate of professional services. The Indian government would like to see a \$1 billion internal market by 1998, served primarily by Indian software developers, but Indian business' affection for U.S. software products from companies such as Microsoft and Novell make it unlikely that domestic production will ever significantly impact the market for capable foreign products. India's software industry is strong—numbering some 500 firms and 32,000 professionals—and currently provides about 25% of the country's internal software product needs. Because so much of the Indian software development market (both products and custom software) is for offshore clients, many of whom reside or are headquartered in the U.S., Indian software development metrics, standards and techniques tend to parallel those used in the United States. Because the U.S. is almost universally regarded as the software development “capital” of the world, this use of the U.S. paradigm is a positive attribute for Indian software.

Exhibit 3 notes the Indian industry segments that are major users of applications and systems software products. They consume both standard software products and custom software (see Professional Services) in the conduct of their business activities.

*Turnkey Systems* - India's turnkey system market is well established—at \$30 million in 1995 and growing at a 22% CAGR to more than \$80 million in 2000. Turnkey systems are effective entry-level resources for businesses starting to establish an IT capability, since hardware, software, and technical support are all provided by the vendor. They also offer attractive alternatives for process control applications in both the discrete and process



## Exhibit 4

**Representative Foreign Software and Services Vendors—India, 1995**

| <b>Company Name</b>               | <b>Country of Origin</b> | <b>Offerings</b>         |
|-----------------------------------|--------------------------|--------------------------|
| Computer Maintenance Corp.        | India                    | Services                 |
| Digital Equipment India, Ltd.     | +United States           | Software and services    |
| Electronics Corporation of India  | India                    | Services                 |
| Hewlett-Packard, Ltd.             | United States            | Software and services    |
| IBM                               | United States            | Software and services    |
| ICL                               | United Kingdom           | Services                 |
| Infosys Consultancy Services      | India                    | Software                 |
| Mastek                            | India                    | Software                 |
| Microsoft                         | United States            | Software                 |
| Novell                            | United States            | Software (joint venture) |
| Onward Computer Technologies, Ltd | India                    | Services                 |
| Oracle                            | United States            | Software                 |
| Tata Consultancy Services         | India                    | Software and services    |
| Tata Unisys, Ltd.                 | United States            | Services                 |
| Wipro Infotech, Ltd.              | India                    | Software and services    |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

In addition to developing and selling their own products and services, many Indian firms also market imported software products. Exhibit 5 is a listing of major Indian software firms and the foreign software products they represent.

UnifAce International is a Netherlands company that offers a popular client/server architecture development tool. MARCAM offers a broad range of manufacturing applications software. Tata has established a technical and financial collaboration with Unisys and also supplies products from Bharat Electronics, Ltd. and Godrej & Boyce. Turnkey providers include Wipro and Computer Maintenance Corporation (CMC), a government supplier of turnkey solutions to the banking, process manufacturing, and utilities industries.



Exhibit 5

Distribution Channels for Foreign Software Products

| Indian Representative              | Software Products Imported                   |
|------------------------------------|--|
| Infosys Consultancy Services       | Symantec, Computer Associates                |
| Tata Unisys, Ltd.                  | Microsoft, Santa Cruz Operation, Autodesk    |
| Wipro Infotech, Ltd.               | Correl Draw, WordPerfect                     |
| Sonata                             | Microsoft                                    |
| NIIT Ltd                           | Software Publishing Corp., Sybase, Intersolv |
| Wipro Systems                      | Borland, SPSS, WordPerfect, Novell           |
| Pertech Computers                  | WordPerfect, Computer Vision, Ingres         |
| Square D Software                  | MARCAM (mfg software), UnifAce Int'l B.V.    |
| Onward Computer Technologies, Ltd. | Aspen Technology, Cypo Int'l, Novell         |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

IT Spending

Exhibit 6 contains INPUT's estimate of 1995 IT spending in India. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the Forecast Database.

Exhibit 6

1995 IT Spending—India

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 170                              | 5                      |
| Internal Staff       | 1,000                            | 30                     |
| Equipment            | 770                              | 23                     |
| Equipment Services   | 270                              | 8                      |
| Facilities           | 340                              | 10                     |
| Information Services | 810                              | 24                     |
| Total IT Spending    | 3,360                            | 100                    |

Numbers are rounded.

Source: INPUT

In response to the steadily improved economic environment, India's information technology (IT) market has been growing at a rate of approximately 25% since the early 1990s. This growth rate should continue for the balance of this decade, with a steadily increasing proportion of the IT budget being allocated to information services offerings—a cost-effective solution to business requirements in a more complex IT environment.

Information services solutions will also help to avoid the need for downsizing or layoffs, which conflict with government regulations (until such regulations are changed).

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for India, for the period 1995-2000.

Exhibit 7

### Information Services Market India, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 618        | 31%              | 807        | 1,053      | 1,382      | 1,814      | 2,385      | 3,144      | 31%            |
| <b>Professional Services</b>    | 258        | 31%              | 338        | 443        | 585        | 775        | 1,030      | 1,374      | 32%            |
| <b>Systems Integration</b>      | 3          | 33%              | 4          | 5          | 6          | 7          | 8          | 9          | 18%            |
| <b>Processing Services</b>      | 20         | 10%              | 22         | 24         | 27         | 31         | 36         | 41         | 13%            |
| <b>Network Services</b>         | 12         | 25%              | 15         | 18         | 22         | 27         | 34         | 43         | 23%            |
| <b>Applications SW Products</b> | 185        | 36%              | 252        | 343        | 465        | 630        | 850        | 1,150      | 35%            |
| <b>Systems SW Products</b>      | 115        | 26%              | 145        | 182        | 230        | 287        | 358        | 444        | 25%            |
| <b>Turnkey Systems</b>          | 25         | 24%              | 31         | 38         | 47         | 57         | 69         | 83         | 22%            |

Source: INPUT





# Worldwide

## Information Services Program

COUNTRY PROFILE

ASIA/PACIFIC

## New Zealand

December 1996

### Economic Overview

New Zealand, like Singapore and Taiwan, is an island nation, but unlike those two economies, which have actively pursued economic growth, New Zealand has been content with a slower pace, with growth tempered by a conservative government and an economy in which agriculture and tourism are major factors. In the last few years, however, New Zealand's economy has grown at a more aggressive rate. Real GDP increased 5.5% in 1993, when the rest of the world was dealing with a global recession and the worldwide GDP grew by only 0.8%. Growth slowed somewhat in 1994 to 3.8%, and reduced further to 3.2% in 1995, as government policies, intended to counteract inflationary pressures, held the economy in check.

Economic growth has been driven by the National Party's desire to establish New Zealand as a "free" economy, similar to that of Asia/Pacific neighbors Singapore and Hong Kong. A key factor in achieving this status is a government climate favorable to free trade—including the tax structure and trade agreements and legislation. Growth has been achieved by such means as a strong privatization program, allowing the currency to float, and imposing a goods and services tax in lieu of the previously high direct taxes. Responding to the growth of the economy, unemployment has steadily dropped from a high of 10.3% in 1991 and 1992 to 6.4% in 1995—and is expected to decline further to a ten-year low of 5.4% in 1997.

But there are uncertainties on the horizon. The election to be held in 1996 is a concern because of changes in rules governing political representation. A strong possibility resulting from this change is that a majority government may not be formed, with potential negative economic implications. It is unlikely, however, that any governmental change will have a long-range effect on New Zealand's growing economy. In the near term, the economic climate will be one of stability and slower, but steady, growth.

Key economic indicators for New Zealand are summarized in Exhibit 1.



## Exhibit 1

**Key Economic Indicators—New Zealand**

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 3.2%  |
| - 1996                   | 3.5%  |
| Inflation Rate (1995)    | 1.6%  |
| Unemployment Rate (1995) | 6.4%  |
| Exchange Rate            | 1.46  |

Sources: GDP and Inflation Data, *World Economic Outlook*, IMF, 1996  
Exchange Rates, *Wall Street Journal*, 7/96  
Unemployment Rates, *CIA Factbook*, 1995

*Business Conditions* - The conversion to a more open economy will stimulate business growth in concert with increases in the GDP—forecast to be 4.4% in 1997. The climate of free trade (versus the closed economy of previous years) will encourage business expansion beyond the traditional agriculture- and tourism-oriented activities of the past. In fact, major positive economic or political changes of this type provide the catalyst for new business opportunities or the expansion of existing enterprises.

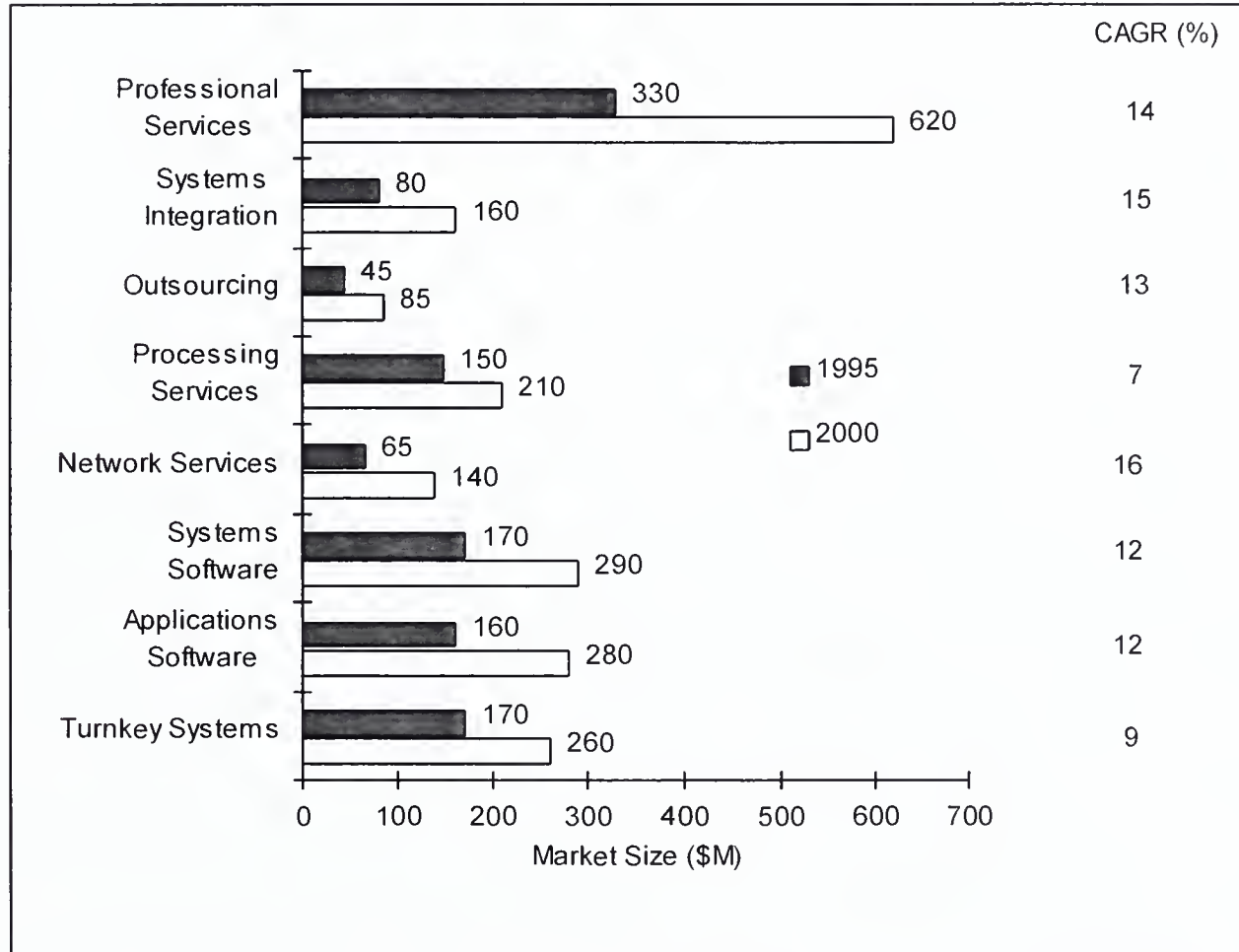
## Information Services Market Forecast

A major benefit of the use of information services is the effective and efficient management and facilitation of change in the IT resources necessary to the conduct of today's business activities. The steady expansion of New Zealand's economy will stimulate change in the IT environment and spending for information services. Overall, the result will be a moderate increase in spending during the forecast period—from nearly \$1.2 billion in 1995 to over \$2 billion in 2000; a compound annual growth rate (CAGR) of 12%. This growth is an improvement upon the 9% seen from 1993 to 1994 and the 11% from 1994 to 1995.

Exhibit 2 summarizes INPUT's market forecast for New Zealand for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A detailed year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
New Zealand, 1995 - 2000**



Numbers are rounded.

Source: INPUT

*Professional Services* - The 1995 professional services market grew 12% in 1995, a 1% improvement over 1994 performance. Growth through 2000 will improve to a 14% CAGR. All subsegments of this market are growing at about the same rate—13% to 14%—reflecting the growing use of all professional services elements—IS consulting, training and education, and software development. Companies such as Andersen Consulting are helping New Zealand firms to change the ways in which they do business to take advantage of the new free market environment, and a major portion of their activities center around identifying necessary changes in the information systems (IS) environment and the development of client-specific software in support of business applications. Overall, professional services is the largest information services market in New Zealand, both in 1995 and 2000.

*Systems Integration* - Systems integration spending was up 3% in 1995, from 13% in 1994 to 16% in 1995. This growth will decline slightly over the five-year forecast period, to a

CAGR of 15%. The strongest movement will be seen in the software products segment, followed closely by professional services. Part of the growth of the software products sector can be attributed to its small base in 1995, but as systems integrators have more standard software products from which to draw to meet client applications and systems needs, spending for such resources as part of SI agreements will continue to increase. SI activities most commonly support the integration of disparate systems and telecommunications resources. A New Zealand Telecom Group division—Netway—is a local supplier of network-related SI services.

*Outsourcing* - Spending for outsourcing is still low compared to global averages, but such numbers are driven by the high usage of this resource in the United States and Europe. As the size of the New Zealand IT market and the complexities of IT enterprise systems increase, a desire for predictable costs or the need to implement new technology will force consideration of other processing alternatives, and spending for outsourcing will increase. Through 2000, the strongest growth will occur with platform operations, the original form of outsourcing, but as production and support environments become more complex, expect to see more enterprise functions outsourced, such as desktop services, network management, application management, and business operations. From a base of \$46 million in 1995, the outsourcing market will grow at a 13% CAGR to \$86 million in 2000.

*Processing Services* - Transaction processing, with its attribute of paying only for what you use, will continue to be the primary processing service. There will be some interim interest in utility processing, as businesses use this function to bridge the step-function gap between successive generations of hardware, software, or telecommunications environments, but usage of this and “other” processing (generally disaster recovery or contingency processing) services will remain a small part of information services spending. Spending for processing services will grow from \$150 million in 1995 to more than \$210 million in 2000—a CAGR of 7%. EDS is a major player in the processing of check-based transactions in New Zealand, holding more than 90% of this market in 1995.

*Network Services* - INPUT expects network services spending to grow at a strong 16% through the year 2000, driven by the increase in network-centric applications and the growing use of the Internet for both inter-company and intra-company communications. E-mail is another strong driver, as is the growing use of electronic commerce between enterprises. Network applications, starting from a smaller base, will grow at 18% CAGR for the forecast period, slightly higher than the information-based EIS services. Overall spending for network services will increase from \$65 million in 1995 to almost \$140 million in 2000.

*Systems and Applications Software* - The market for both systems and applications software will grow at 12% from 1995 through 2000. The highest growth and the most



spending will occur for software for PC platforms. As more New Zealand businesses expand their activities in both domestic and global markets, application-specific software products, client/server architectures and network-centric software products are becoming a necessity in order to maintain or improve competitive positioning. As with most Asia/Pacific countries, U.S. software products are popular and competitively priced, and represent the largest percentage of “shrink-wrapped” software imports in this market. Piracy is not the issue that it is in other countries (such as China), and most software is legally purchased so as to have access to updates, technical support, and full documentation. The total market for applications and systems software products will grow at a CAGR of 12%—from almost \$330 million in 1995 to \$570 million in 2000. At the millennium, the software products market will account for more than 25% of all information services spending, down slightly from 1995’s 28% figure. IBM and Microsoft, and New Zealand’s Stream International, Inc. and The Great Elk are software product suppliers in this market

*Turnkey Systems* - Turnkey systems will continue their 8% to 9% growth during the forecast period. For many smaller business and farming enterprises, they represent the most cost-effective solution. As applications are married to more sophisticated platforms, there will be a peak in equipment spending in 1998, and then overall year-to-year growth will drop to 8% through the millennium—yielding a 1995-2000 CAGR of 9%. The turnkey-systems-based software products market will be steady at a 10% growth rate, and spending for professional services will diminish slightly during the forecast period to an 8% CAGR. Although comparatively small, the New Zealand market for specialized, integrated systems will grow from nearly \$170 million in 1995 to almost \$260 million in 2000.

*The Internet* - Despite its relatively small size, New Zealand is active on the Internet, with more than 50,000 permanently connected users in 1996, and in excess of 3,000 separate domains (of which 83% are commercial or business users)—populations determined by New Zealand’s Ministry of Commerce. The New Zealand Internet Exchange connects offshore providers and international traffic with local Internet Service Providers (ISPs) and also provides local linkages between domestic ISPs. As New Zealand’s free trade economy expands its activities in the growing global market, and more transactions are conducted using electronic commerce, e-mail, EDI and other commerce facilitators, Internet use will also increase.

## Software and Services Vendors

The following table (Exhibit 3) provides a representative listing of firms providing information services in New Zealand. The company name, country of origin, and an indication of offerings—software or services—are provided. Although some revenue data is



available, insufficient information for most companies makes estimates of market share unreliable. Data is based upon 1995-1996 information

Exhibit 3

Representative Foreign Software and Services Vendors—New Zealand, 1995

| Company Name   | Country of Origin | Offerings                      |
|--|-------------------|--------------------------------|
| Andersen Consulting                                  | United States     | Services                       |
| CSC  | United States     | Services                       |
| Digital Equipment Corp.                              | United States     | Software and services          |
| The Great Elk  | New Zealand       | Software                       |
| IBM  | United States     | Software and services          |
| McDonnell Douglas Information Systems Pty Ltd (MDIS) | New Zealand       | Services (systems integration) |
| Microsoft  | United States     | Software                       |
| Netway   | New Zealand       | Services (systems integration) |
| Oracle   | United States     | Software                       |
| Stream International, Ltd.                           | New Zealand       | Software                       |
| Unisys   | United States     | Software and services          |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

MDIS provides systems integration services to its clients and is a major supplier of IT solutions to New Zealand’s healthcare market. Netway is a division of New Zealand’s largest telecommunications supplier, Telecom New Zealand, and specializes in network-oriented SI services. The Great Elk offers a variety of software products, and most recently announced a new multidimensional analysis tool, Panorama 2.1. Stream International is one of the largest software product developers in Australia and New Zealand. It was formed when Stream acquired the Australian/New Zealand holdings of R.R. Donnelly.

IT Spending

The following table (Exhibit 4) offers INPUT’s estimate of 1995 IT spending in New Zealand. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment

components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the following section, Forecast Database.

Exhibit 4

1995 IT Spending—New Zealand

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 350                                 | 6                      |
| Internal Staff       | 1,750                               | 30                     |
| Equipment            | 1,350                               | 23                     |
| Equipment Services   | 510                                 | 9                      |
| Facilities           | 760                                 | 13                     |
| Information Services | 1,150                               | 20                     |
| Total IT Spending    | 5,870                               | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for New Zealand, for the period 1995-2000.

## Exhibit 5

**Information Services Market  
New Zealand, 1995-2000**

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 1,050      | 11%              | 1,161      | 1,296      | 1,446      | 1,623      | 1,817      | 2,037      | 12%            |
| <b>Professional Services</b>    | 292        | 12%              | 326        | 372        | 422        | 480        | 545        | 617        | 14%            |
| - IS Consulting                 | 80         | 13%              | 90         | 102        | 116        | 134        | 152        | 170        | 14%            |
| - Education & Training          | 30         | 10%              | 33         | 37         | 43         | 48         | 55         | 62         | 13%            |
| - Software Development          | 182        | 12%              | 203        | 233        | 263        | 298        | 338        | 385        | 14%            |
| <b>Systems Integration</b>      | 68         | 16%              | 79         | 90         | 104        | 120        | 139        | 161        | 15%            |
| - Equipment                     | 25         | 12%              | 28         | 29         | 33         | 37         | 43         | 51         | 13%            |
| - Software Products             | 8          | 25%              | 10         | 12         | 14         | 16         | 20         | 24         | 19%            |
| - Professional Services         | 33         | 18%              | 39         | 47         | 55         | 64         | 73         | 83         | 16%            |
| - Other                         | 2          | 0%               | 2          | 2          | 2          | 3          | 3          | 3          | 8%             |
| <b>Outsourcing</b>              | 42         | 10%              | 46         | 52         | 59         | 67         | 76         | 86         | 13%            |
| - Platform Operations           | 23         | 13%              | 26         | 30         | 35         | 40         | 46         | 52         | 15%            |
| - Applications Operations       | 19         | 5%               | 20         | 22         | 24         | 27         | 30         | 34         | 11%            |
| <b>Processing Services</b>      | 139        | 8%               | 150        | 160        | 170        | 183        | 197        | 213        | 7%             |
| - Transaction Processing        | 120        | 8%               | 129        | 137        | 145        | 155        | 167        | 180        | 7%             |
| - Utility Processing            | 11         | 9%               | 12         | 13         | 14         | 16         | 18         | 20         | 11%            |
| - Other Processing              | 8          | 13%              | 9          | 10         | 11         | 12         | 12         | 13         | 8%             |
| <b>Network Services</b>         | 57         | 14%              | 65         | 74         | 86         | 99         | 115        | 135        | 16%            |
| - Electronic Information Svcs   | 45         | 16%              | 52         | 59         | 68         | 78         | 90         | 105        | 15%            |
| - Network Applications          | 12         | 8%               | 13         | 15         | 18         | 21         | 25         | 30         | 18%            |
| <b>Applications SW Products</b> | 144        | 11%              | 160        | 179        | 200        | 224        | 250        | 279        | 12%            |
| <b>Systems SW Products</b>      | 151        | 10%              | 166        | 184        | 206        | 231        | 258        | 290        | 12%            |
| <b>Turnkey Systems</b>          | 157        | 8%               | 169        | 185        | 199        | 219        | 237        | 256        | 9%             |
| - Equipment                     | 69         | 6%               | 73         | 80         | 87         | 95         | 102        | 110        | 9%             |
| - Software Products             | 42         | 10%              | 46         | 51         | 55         | 61         | 67         | 73         | 10%            |
| - Professional Services         | 46         | 9%               | 50         | 54         | 57         | 63         | 68         | 73         | 8%             |

Source: INPUT



# Worldwide

## Information Services Program

COUNTRY PROFILE

ASIA/PACIFIC

## Singapore

December 1996

### Economic Overview

Since it became an independent nation in 1965, Singapore's government has emphasized both a strong economy and political stability. In pursuit of these objectives, this small country (approximately 3.5 times the area of Washington, D.C.) with a population of about 3 million people has been a strong supporter of regional cooperation (it is a prime partner in the ASEAN group—the Association of Southeast Asian Nations) and a strong trading partner of the United States (it is the U.S.'s 10th largest export market). Singapore offers a highly sophisticated market for foreign goods—a logical result of its well-educated and well-paid labor force, low unemployment rate and strong business community. Its function as a regional trade and financial center has also given it a strong position as a distribution point, and fully one-third of all imports are re-exported, usually to ASEAN partners. To understand the importance of foreign trade to this economy, it is only necessary to know that the value of Singapore's foreign trade activity is about three times its GDP. Singapore has used this presence and commitment as a foundation upon which to build a sophisticated trade infrastructure, including up-to-date air and sea transport facilities, and leading-edge telecommunications resources.

Singapore's economic growth was particularly strong in the early 1990s. Since 1994, however, when the GDP growth rate was 10.1%, expansion has declined—to 8.9% in 1995 and an estimated 7.5% in 1996. The success realized in prior years is partly responsible for the slowing of the economy. A declining birth rate, coupled with the rapid pace of economic growth, has created a shortage of labor and internal skills, a condition that will continue for some time despite strong government efforts to upgrade the expertise of the labor force, move labor-intensive activities to low-cost offshore ASEAN partners such as Malaysia, and automate production facilities where practical. Also of concern is the fact that wage increases are currently greater than improvements in productivity.

Politically, the strong, paternalistic government has come under some criticism for a few highly publicized incidents involving the punishment of lawbreakers, but in general, both



foreign and domestic businesses favor a safe, stable environment in which to conduct their activities—an enviroment that Singapore provides.

Key economic indicators for Singapore are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—Singapore

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 8.9%  |
| - 1996                   | 7.5%  |
| Inflation Rate (1995)    | 1.7%  |
| Unemployment Rate (1994) | 2.6%  |
| Exchange Rate            | 1.41  |

Sources: GDP and Inflation Data, World Economic Outlook, IMF, 1996  
Unemployment Rate, CIA Factbook, 1995  
Exchange Rates, Wall Street Journal, 7/96

*Business Conditions* - Singapore is “business friendly,” with more than 95% of imports entering the country duty free. Some restrictions apply to the banking and telecommunications industries, but in general, these are intended to strengthen Singapore’s indigenous resources in these areas. Even at a reduced growth rate of 7.5%, Singapore’s economy is still one of the strongest in the Asia/Pacific area, with solid growth anticipated in such industry sectors as utilities, health care, and transportation. Singapore is also evolving into a major aircraft repair and maintenance hub for Southeast Asia, and plans to become the predominant airport facility in the region by the year 2000.

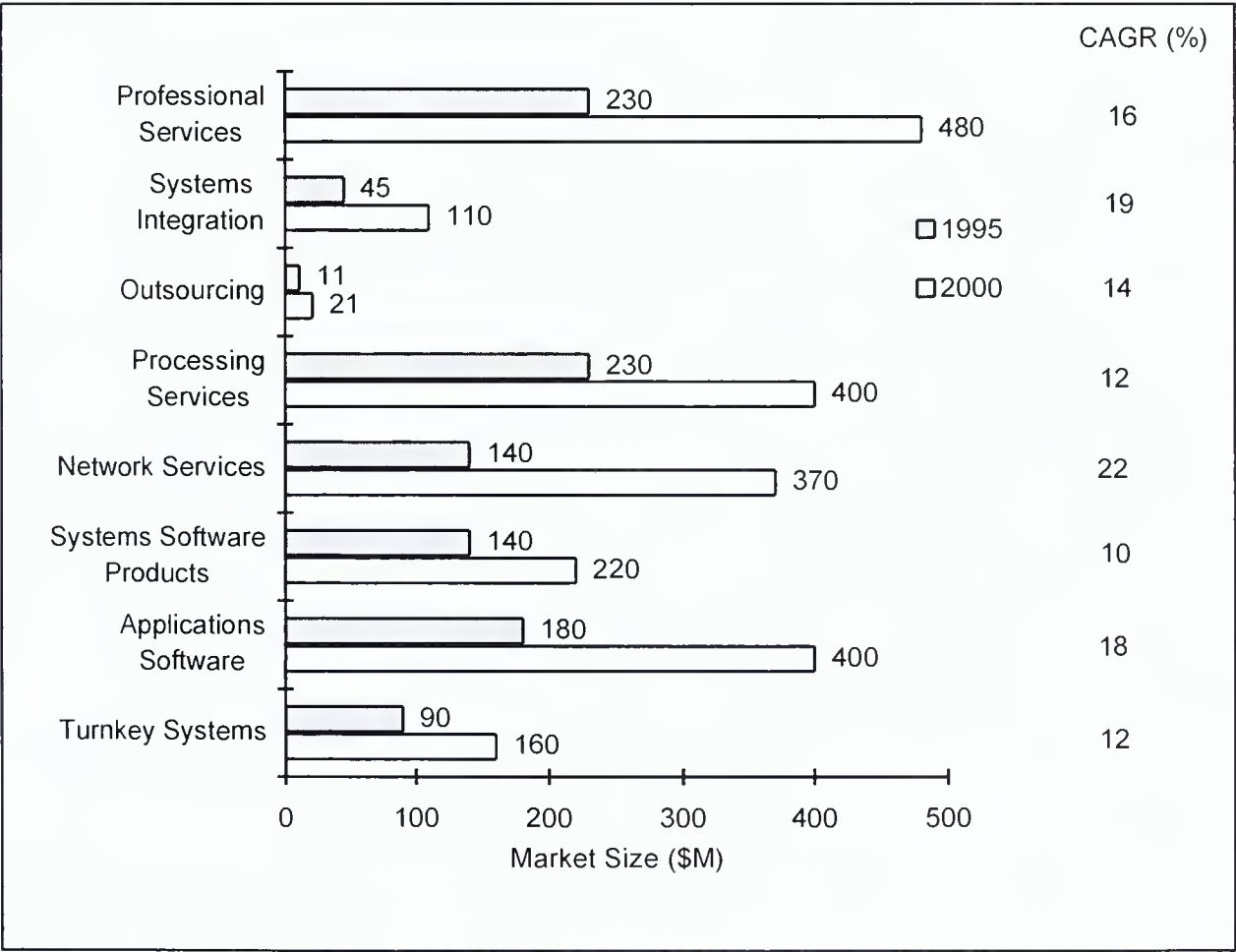
Singapore’s IT infrastructure is the most mature of the ASEAN countries, and the government has a plan in place—IT 2000—to use information technology to: increase manufacturing, commerce and construction; enhance the individual potential of its citizens; link communities both locally and globally through networking; and boost tourism. Taken as a separate set of objectives, or coupled with Singapore’s ambitious plans to become a major player in global banking, transportation and telecommunications, Singapore’s IT 2000 plan represents opportunity both for local enterprises and for companies doing business or planning to do busisness in that country.

Information Services Market Forecast

Singapore’s information services market will grow from more than \$1 billion in 1995 to nearly \$2.2 billion in 2000—a compound annual growth rate (CAGR) of 15%. Exhibit 2 summarizes INPUT’s market forecast for Singapore for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

Market Forecast by Product/Service Category  
Singapore, 1995 - 2000



Numbers are rounded.

Source: INPUT

*Professional Services* - The professional services market in Singapore is the largest services market, and will grow to almost \$500 million by the year 2000. Key areas are IT consulting for the sophisticated business community and training and education for the island’s growing population of IT professionals. The development of a skilled professional IT infrastructure is an integral part of Singapore’s IT 2000 plan—a government initiative

that will continue to drive the growth of the professional services market through the millennium. Software development activities will also be an important factor in this market, as the competitive pressures resulting from Singapore's goal of becoming a (if not "the") dominant economic force in the ASEAN region motivates firms to develop and implement unique software solutions to business needs. One result of the competitive stimulus, for professional services, will be a steady compound annual growth of 16% through the year 2000.

*Systems Integration* - Systems integration (SI) efforts are concentrated in two major areas: tying together diverse systems to function in the new complex, global, network-centric enterprise processing environment; and the development, integration and implementation of the telecommunications resources necessary for a "global" market to conduct business. In addition to the SI activities of equipment manufacturers such as IBM, Digital Equipment, Unisys, and Fujitsu (Japan), Andersen Consulting and EDS also have SI contracts in Singapore and local firms, such as Singapore Computing Systems and Computer Systems Advisors, offer SI services. Responding to the current growth needs of Singapore's business community and the government's IT objectives for the year 2000, the SI market in Singapore will grow at a CAGR of 19% for the next five years, reaching more than \$110 million in 2000. The fastest increase will be for SI-related professional services to guide the growth and expansion of Singapore's IT assets.

*Outsourcing* - Although there has been strong growth in Singapore's IT expenditures, matching the needs of its economic expansion, the outsourcing market is relatively small, at only \$11 million in 1995 and growing at a 14% CAGR to \$21 million in the year 2000. Outsourcing has been a recently developed resource, starting to grow only in the past few years, as Singapore's business community is forced to consider alternative processing services to fix or reduce the country's growing labor costs. Traditionally, the predominant outside processing resources have been local processing services (see below), where the usage-sensitive cost structure favored the occasional user and "cycles" were available as needed. Now, as both costs and availability of key technical skills become issues, the outsourcing market is starting to grow. If the government is unable to solve the labor shortage and skills problems—a likely scenario for the next five years—growth in outsourcing will be even greater, as service providers offer the key resources in limited availability elsewhere. The natural growth of Singapore's businesses will also be a factor, as competitive pressures force a refocusing on core competencies and a migration to more cost-effective production environments—e.g., outsourcing.

*Processing Services* - The processing services market has been strong in Singapore and is forecast to continue growth at a moderate 12% CAGR through 2000, at which time it will total almost \$400 million. This market, which grew as the incremental costs of transaction processing continued to be attractive throughout Singapore's strong economic growth years



(the early 1990s), has also benefited from the cost advantages of using alternative processing environments to accommodate processing needs while at the same time moderating the growth of IT expenditures. The Internet will also drive the use of processing services for financial clearings related to electronic commerce.

*Network Services* - Reflecting the increasing importance of telecommunications, especially to a country that is a major center of international commerce, the network services market in Singapore will grow from nearly \$140 million in 1995 to \$370 million by the year 2000—a CAGR of 22%, the highest information services growth rate in this country. Singapore has a vision—to transform itself into an “intelligent island” by the year 2005. To implement this vision, the government has undertaken a number of initiatives aimed at establishing and maintaining a state-of-the-art telecommunications infrastructure. Singapore was the first ASEAN nation to offer ISDN capability so that data, video and voice could all be carried over the same line. The growing use of fiber-optics, even to the home, is encouraging more businesses to offer network-based service options, such as home banking, and on-line news services. These applications, in turn, are driving businesses to develop business-to-business and business-to-consumer communications-based services similar to those offered in the United States and Europe. These applications require the use of complex network delivery vehicles and value-added services for their implementation. The same network-conscious Singapore market also uses on-line databases for access to news, electronic commerce and trade, and financial databases. Telecommunications resources and network services will be key assets in the Singapore market well into the next century. Singapore’s government-owned network services provider—Singapore Network Services (SNS)—offers a variety of on-line services, including MailLink (e-mail), RealNet (property data), CoinNet (construction data), LawNet (legal data), Biznet (business data) and TradeNet (trade documentation).

*Systems and Applications Software Products* - The software products market will grow from over \$300 million in 1995 to more than \$600 million in 2000—a CAGR of 15%. In 1992, a survey conducted by Singapore’s National Computer Board (NCP) indicated that 84% of firms with ten or more employees used computers and 63% used networks in the conduct of their business. These numbers have increased in the four years since the last full study was conducted, and INPUT estimates that more than 90% of businesses use computers and that 75% or more are networked. The majority of the systems software product growth (1995-2000 CAGR of 10%) will be in the area of operating environment and database management systems for workstation/PC platforms. Industry use of applications software products (CAGR of 18%) is especially strong in the financial services (banking, finance and insurance), electronics, telecommunications infrastructure (common carrier, LAN and WAN providers), trading and import/export, and airline/transportation markets. These industries are also heavy users of database management systems. The largest foreign source of applications software products is the United States, with firms like



Microsoft, Novell, IBM, Oracle and Digital Equipment serving this market. Because Singapore is well positioned as a regional hub for the ASEAN market, most of the software product firms (and also other information services firms) have established offices on the island not only to provide products (and services) to the Singapore market, but also to serve the rest of the ASEAN community. This reality is consistent with Singapore's IT 2000 strategy and will continue through the millennium.

*Turnkey Systems* - Turnkey systems continue to be an accepted processing resource in Singapore, and this market will continue its steady 12% CAGR through 2000—with spending growing from slightly over \$90 million in 1995 to \$160 million at the turn of the century. Application-specific platforms include those used for accounting and resource management activities. Energy performance-monitoring systems, health care function-specific and environmental monitoring systems represent other Singapore markets for turnkey systems. Manufacturing activity is limited, compared to other countries such as Taiwan, South Korea, or Japan, and there is not the market for manufacturing control systems and computer-aided design systems seen in other, more industrialized nations.

*Singapore's IT 2000 Initiative* - Driving Singapore's market for information services is the government's IT 2000 plan—a key element in Singapore's strategy to be the business hub of the ASEAN community. Exhibit 3 summarizes six key points in the IT 2000 plan noted in the U.S. Department of Commerce's analysis of this marketplace. The last point formalizes Singapore's desire to become less dependent upon foreign software suppliers—a long-term objective whose impact will not be felt before the millennium.

Exhibit 3

**Singapore's IT 2000 Plan—Key Points**

- Develop Singapore as a global hub for information, finance and transportation.
- Boost manufacturing, commerce, construction and tourism with IT.
- Enhance individual potential through training in IT.
- Link communities globally and locally through IT networking.
- Improve the quality of life through IT.
- Establish Singapore as a supplier of software products and source of software development.

Source: U.S. Department of Commerce, ITA, 1996

*The Internet* - The Internet is a key piece in the mosaic of Singapore's technology plan for the future. The government's goal to become an "intelligent island" by 2005 requires the establishment of a sophisticated telecommunications infrastructure—one element of which is the Internet. Examples of Internet access providers in Singapore include the National

University of Singapore, SingNet and the Asia Pacific Internet Company Pty, Ltd. Asia Pacific Internet, headquartered in Sydney, Australia, provides speeds up to 28.8 KB and also provides virtual Internet servers, Internet software tools, and electronic marketplaces.

*Software Piracy* - Despite its strong government, Singapore's intellectual property rights (IPR) violations are sufficiently numerous to place it on the U.S. government's Special 301 "watch list." One problem is a lack of agreement between the World Trade Organization's (WTO) TRIPS Agreement and Singapore's IPR legislation. This is being corrected, and Singapore is prosecuting software piracy under its statutes, but still, as in other Asia/Pacific nations, piracy is a major concern.

## Software and Services Vendors

The following table (Exhibit 4) provides a representative listing of firms providing information services in Singapore. The company name, country of origin, and an indication of offerings—software or services—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Data is based upon 1995-1996 information.

Exhibit 4

### Representative Software and Services Vendors—Singapore, 1995

| Company Name                            | Country of Origin | Offerings             |
|---|-------------------|-----------------------|
| Andersen Consulting                     | United States     | Services              |
| Asia Pacific Internet Company Pty, Ltd. | Australia         | Services (Internet)   |
| CAP GEMINI S.A.                         | France            | Services (SI)         |
| Computer Systems Advisors               | Singapore         | Services (SI)         |
| Digital Equipment Corp.                 | United States     | Software and services |
| EDS                                     | United States     | Services              |
| Fujitsu Pty, Ltd.                       | Japan             | Software and services |
| IBM                                     | United States     | Software and services |
| Microsoft                               | United States     | Software              |
| Novell                                  | United States     | Software              |
| Oracle                                  | United States     | Software              |
| Singapore Computer Systems              | Singapore         | Services (SI)         |
| Unisys                                  | United States     | Software and services |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

## IT Spending

Exhibit 5 contains INPUT’s estimate of 1995 IT spending in Singapore. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the Forecast Database.

Exhibit 5

1995 IT Spending—Singapore

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 300                              | 7                      |
| Internal Staff       | 1,250                            | 30                     |
| Equipment            | 930                              | 22                     |
| Equipment Services   | 250                              | 6                      |
| Facilities           | 420                              | 10                     |
| Information Services | 1,050                            | 25                     |
| Total IT Spending    | 4,200                            | 100                    |

Numbers are rounded.

Source: INPUT

IT spending should continue at current levels as the Singapore government’s IT 2000 plan and related spending programs drive both technology and the business and technical infrastructure of the nation. A downturn in labor rates would reduce internal staff costs and slow the growth rate somewhat, as would the shifting of burdened enterprise IT labor costs to unburdened information services costs. IT expenditures as a percentage of GDP should remain above the global average for Singapore as a result of the relatively small industrial base and the strong movement toward an expanded IT infrastructure.

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 6) for Singapore, for the period 1995-2000.

## Exhibit 6

**Information Services Market  
Singapore, 1995-2000**

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 921        | 15%              | 1,056      | 1,210      | 1,389      | 1,602      | 1,858      | 2,160      | 15%            |
| <b>Professional Services</b>    | 198        | 16%              | 229        | 263        | 302        | 349        | 408        | 480        | 16%            |
| <b>Systems Integration</b>      | 39         | 18%              | 46         | 54         | 64         | 77         | 93         | 112        | 19%            |
| <b>Outsourcing</b>              | 10         | 10%              | 11         | 12         | 14         | 16         | 18         | 21         | 14%            |
| <b>Processing Services</b>      | 203        | 11%              | 226        | 252        | 282        | 315        | 353        | 395        | 12%            |
| <b>Network Services</b>         | 115        | 21%              | 139        | 168        | 203        | 247        | 302        | 370        | 22%            |
| <b>Applications SW Products</b> | 152        | 17%              | 178        | 208        | 243        | 286        | 338        | 400        | 18%            |
| <b>Systems SW Products</b>      | 122        | 11%              | 135        | 150        | 166        | 183        | 202        | 222        | 10%            |
| <b>Turnkey Systems</b>          | 82         | 12%              | 92         | 103        | 115        | 129        | 144        | 160        | 12%            |

Source: INPUT







# Worldwide

## Information Services Program

COUNTRY PROFILE

ASIA/PACIFIC

## South Korea

December 1996

### Economic Overview

After a strong 1994 (8.4% increase in GDP) and a stronger 1995 (9.0% increase), South Korea's pace of economic growth is expected to decline slightly in 1996 to a 7.6% rate. The decline is the result of two factors: a loss of the competitive advantage held by South Korea over Japan as the yen continues to weaken against the U.S. dollar, and a decrease in the rate of investment, which has been high over the last two years. A key government priority for 1996 is to minimize the impact of these changes on the Korean economy, and continue the pace of economic growth at a stable but slightly lower pace than has occurred over the last two years. To that end, government spending will be increased somewhat, and monetary policies eased to aid the "soft landing" of the South Korean economy. One concern is the possibility of a recession as the economy slows, but this threat should be mitigated by the government's supportive actions.

Although most recent investment activity has been aimed at strengthening and developing South Korea's manufacturing resources, new investment activities for the next few years are expected to focus on the development of knowledge-capital-intensive industries. This represents a shift away from the emphasis on the more traditional labor-intensive industries that drove South Korea's economic growth for so many years, capitalizing on the lower labor costs that offered competitive advantage in world markets. Unemployment is expected to remain at a low 2%, with attendant problems with skill availability. High employment rates will also be a factor in the labor negotiations started in May of this year, and will serve to drive wage rates higher. Inflation, a moderate 5% in 1995, should decline further in 1996 to 4.8% and reach 4.5% in 1998.

*Chaebols* - A key, and somewhat unique, element in the South Korean economy is the chaebols—industrial conglomerates, generally focused on exports—that dominate the business environment. The chaebols, which function under the industrial and economic policies set by the South Korean government, receive preferential treatment, such as low-cost government loans, and tariff concessions. The chaebols also benefit from a

government policy of internal procurement wherever possible, limiting purchases from foreign suppliers. However, foreign companies that manufacture in South Korea are considered domestic resources and can be awarded government contracts. Although there is strong competition between chaebols, government policies favor inter-chaebol cooperation and transactions, where practicable. The strong position of the chaebols in the Korean economy have motivated many foreign firms, including U.S. information services vendors, to seek alliances or joint ventures with various industrial conglomerates in order to do business in the country. An example is EDS, which has a long-term (started in 1987) joint-venture partnership, LG-EDS Systems, with Lucky Goldstar, the Korean electronics giant.

Key South Korean economic indicators are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—South Korea

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 9.0%  |
| - 1996                   | 7.6%  |
| Inflation Rate (1995)    | 5.0%  |
| Unemployment Rate (1995) | 2.0%  |
| Exchange Rate            | 811   |

Sources: GDP and Inflation Data, World Economic Outlook, IMF, 1996  
Unemployment Rate, CIA Factbook, 1995  
Exchange Rates, Wall Street Journal, 7/96

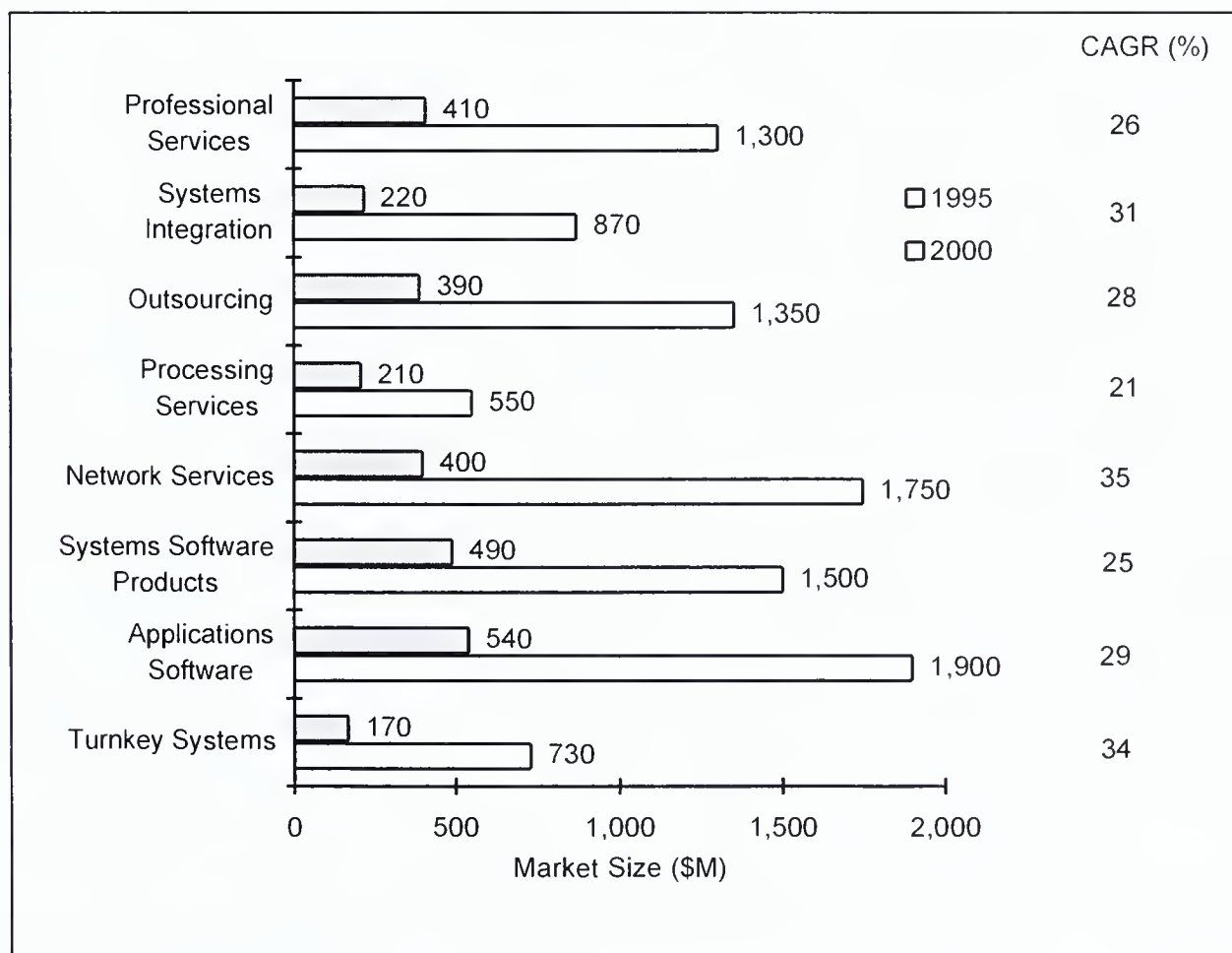
*Business Conditions* - Business conditions will remain favorable for the next few years, as the recent period of rapid expansion settles down to a steady, sustainable growth economy. To support growth and prepare South Korea for a strong position in the 21st century, the government has launched the Highly Advanced Nation, or HAN Project. Under this initiative, South Korea will concentrate its R&D resources in selected areas in which it has already established a competitive advantage, including products and capabilities in the areas of energy, electronics, chemicals and pharmaceuticals, and environmental technology. Although the New Korea Party lost its parliamentary majority in the election held earlier this year, an encouraging sign is that the loss was small, signaling the voters' preference for economic stability. The New Korea Party must now seek independent support for its economic growth and anti-corruption programs, but such support is anticipated and a continuation of the government's policies for expansion will bode well for the business climate in South Korea.

## Information Services Market Forecast

Responding to the country's continued strong economy and such all-encompassing initiatives as the HAN Project, South Korea's information services market will grow from more than \$2.8 billion in 1995 to nearly \$9.9 billion in 2000—a compound annual growth rate (CAGR) of 29%, the second highest rate of growth in the Asia/Pacific region, behind India's 31%. Exhibit 2 summarizes INPUT's market forecast for South Korea for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
South Korea, 1995 - 2000**



Numbers are rounded.

Source: INPUT

*Professional Services and Systems Integration* - Both professional services and systems integration (SI) will see strong growth during the five-year forecast period, as business needs for technical support for expansion, coupled with a shortage of technical skills, favor



the use of outside resources for IT planning and analysis, IT-related training and education, software development activities, and the consolidation, enhancement or expansion of critical IT resources. Major foreign manufacturers such as IBM, Unisys, Digital Equipment, and Fujitsu maintain a strong presence in this market, as do local computer companies such as Hyundai. These vendors offer both professional services and the SI resources to satisfy the IT planning, selection, implementation, performance monitoring, and change management needs of Korean enterprises. Other major vendors in this market include Andersen Consulting, EDS, Hewlett-Packard, and Unisys. Given the continued aggressive pace of change in South Korea, coupled with the country's desire to import technology and implement it for use in Korean industries rather than just importing the products of technology, this market will remain strong through the millennium. The market for professional services will grow from over \$400 million in 1995 to almost \$1.3 billion in 2000 at a 26% CAGR. Systems integration growth will be even more aggressive, with the South Korean market for such services almost quadrupling from 1995 to 2000, at a CAGR of 31% and a year-2000 size of more than \$850 million. Growth and change—the catalysts that are creating opportunity for professional services and systems integration support in this market.

*Outsourcing* - Outsourcing, a cost-effective method of accessing skill sets in limited availability and fixing costs in South Korea's strong labor market, will experience aggressive growth during the forecast period, increasing from less than \$400 million in 1995 to more than \$1.3 billion by the year 2000—a CAGR of 28%. As the sophistication of the South Korean IT environment grows, and costs increase accordingly, outsourcing will appear more attractive to the major industrial firms. Functions that will be outsourced include platform, application and business operations, network and applications management, and desktop services. Desktop services is a strong growth area not only in South Korea, but in most industrialized nations; growth is driven by the steadily increasing population of PCs and the trend towards client/server architecture and a distributed processing environment. As the HAN Project and similar government initiatives gain momentum, the advantages of outsourcing IT activities in order to concentrate on primary initiative objectives (e.g., R&D programs in the case of the HAN Project) will be determining factors in the choice of processing environments.

*Processing Services* - Processing services, like outsourcing, offers clients a means of controlling costs. Transaction-oriented processing services offer a pay-as-you-go alternative, relating costs directly to transaction volumes. In South Korea, the transaction services provided include traditional payroll, demand deposit and credit card clearing applications, but a rapidly growing Internet environment will add the on-line transactions used for commercial activities into that milieu. Another area of opportunity will be contingency processing services—more commonly known as disaster recovery services—a necessary resource in a country subject to climate extremes and potential unrest caused by

unfriendly neighbors. As South Korea proceeds steadily toward its economic objectives, care will be taken to protect the economic and IT resources necessary to assure business continuity. The second smallest of South Korea's information services markets, processing services will grow from over \$200 million in 1995 to \$550 million in 2000—a CAGR of 21%.

*Network Services* - Growth and opportunity seem to be terms synonymous with network services. Driven by the ubiquitous Internet, the steady migration toward network-centric computing and the globalization of all forms of commerce, the network services market is the most rapidly growing information service in almost all countries—and South Korea is no exception. At a 35% CAGR, network services is the fastest growing product/service category in this country, going from a base of almost \$400 million in 1995 to over \$1.7 billion by the year 2000. Driving this growth is South Korea's strong emphasis on the country's telecommunications infrastructure, the steady growth in the number of Internet access providers (see the following section, Software and Services Vendors) and the growing importance of on-line databases and function-specific networks to the business and economic community. Databases such as Reuters (U.K.), Lexis/Nexis (U.S.) and Dialog (U.S.) are augmented by Korea-based services such as the Data Communications Corporation of Korea (DACOM) and the Korean Institute of National Industry & Technology Information (KINITI), two government-supported services. Other Korean database services include that of Samsung Data Systems (SDS) and news agencies like the Maekyong News Daily and the Yonhap News Agency. Most of the databases offer both English and Korean search engines for client use.

*Systems and Applications Software Products* - South Korea is a heavy consumer of systems and applications software products, with a total software market of slightly over \$1 billion in 1995, growing at a 27% CAGR to almost \$3.4 billion by the year 2000. The strong acceptance by the South Korean market of U.S. computer systems and related software, sales and service (post-installation) support has led to an equivalent acceptance of U.S. software products. This is especially true for systems software products in which virtually all the software has been developed outside the country by manufacturers (such as IBM, Digital Equipment, Unisys, or Fujitsu) or dominant PC platform vendors such as Microsoft. An area where local vendors do have a significant market share is the word processor market; in fact, a U.S. Department of Commerce estimate in 1995 placed the South Korean software vendors' share of this market at 68%, with the Hangul & Computer Co., Ltd. a major supplier. Microsoft was the largest foreign word processor supplier. Familiar U.S. software vendors active in this market include Borland, Computer Associates, Informix, Novell, Oracle, the Santa Cruz Operation and Sybase. Korea-based software suppliers include Hyundai Electronics, LG Software (Lucky Goldstar), Samsung Electronics and Samsung Data Systems. Besides supporting the traditional needs (word processors, spreadsheets, presentation graphics and other personal productivity tools) of the huge (and growing) base of workstation/PCs, there is a strong market for middleware



and application-specific software products—and there is no indication that this need will diminish in the next few years.

In order to compete effectively in the chaebol-dominated Korean marketplace and also to be able to bid on the South Korean government's equivalent of an "RFP" (Request for Proposal), many foreign software vendors either establish Korean subsidiaries or enter into alliances or joint ventures with Korean partners—typically chaebol members. This should continue to be an effective strategy at least through the millennium.

*Turnkey Systems* - The smallest of South Korea's product/service markets, turnkey systems has experienced, and will continue to experience, strong growth through the year 2000. This growth was driven initially by the heavy investments made by both the government and the private sector in the country's manufacturing, energy management, telecommunications and environmental management industries. Each of these industries uses function-specific dedicated turnkey systems to monitor and control critical applications, such as manufacturing processes, waste management, power generation, or network availability. Even though Korea's period of heavy investment in capital equipment and the enhancement and expansion of key production resources has now evolved into a time of slower but steady economic growth, the need for the turnkey platforms that perform critical functions will continue through the millennium. Given the limited labor and skill availability in South Korea, coupled with the ever-present need of both government and business to monitor and control this scarce resource, an area of opportunity will be the provision of turnkey platform-based human resource management systems similar to those so common in the United States.

*The Internet* - South Korea has embraced the Internet and has been an active user of Internet resources for more than two years—long before the Internet acquired the panache it enjoys today. As competitively aware South Korean firms watch their edge in world markets diminish as Korean labor rates increase and the yen declines against the dollar, allowing a resurgence of interest in Japanese products, these businesses are looking to the Internet as a new marketing and business facilitation opportunity. To that end, a number of Korea-based Internet access providers now offer service in that country. A sampling of these vendors is noted in Exhibit 3. Because of the forward-looking nature of the South Korean government (e.g., the HAN Project) and the strongly competitive nature of Korean businesses, Internet usage should grow dramatically in this country over the next few years.

## Exhibit 3

**South Korean Internet Access Providers**

- DACOM
- Hana Network
- KORNET
- KREN (Korea Research and Education Network)
- KREONet (Korea Research Environment Open Network)
- NuriNet

*Source: U.S. Department of Commerce  
Best Internet Communications (Web Site)*

*Software Piracy* - Piracy is a problem in South Korea, as it is in almost all Asia/Pacific nations, but the Software Publisher's Association (SPA), the Business Software Alliance (BSA), the International Intellectual Property Alliance (IIPA) and the Korean government are cooperating to decrease the level of software piracy in this country. A key government motivator is avoidance of conflicts with the United States, Korea's primary software supplier. Two industry associations, the Korean Software Industry Association (KSIA) and the Korean Information Systems Industry Association (KISIA), are also active in protecting intellectual property rights (IPR). Although such efforts don't guarantee IPR, they do indicate the attitude of the South Korean government and Korean industry, and reflect a strong commitment to control software piracy.

**Software and Services Vendors**

The following table (Exhibit 4) provides a representative listing of the larger foreign firms providing information services in South Korea. The company name, country of origin, and an indication of offerings—software or services—are provided. Parenthetical entries offer product/service highlights. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Data is based upon 1995-1996 information.



Exhibit 4

**Representative Foreign Software and Services Vendors—South Korea, 1995**

| Company Name                   | Country of Origin | Offerings  |
|--------------------------------|-------------------|--|
| Andersen Consulting            | United States     | Services (professional services and systems integration) |
| Borland                        | United States     | Software   |
| CompuServe                     | United States     | Services (database)                                      |
| Computer Associates, Inc. (CA) | United States     | Software   |
| Compuware                      | United States     | Software   |
| Dialog                         | United States     | Services (database)                                      |
| Digital Equipment              | United States     | Software and services                                    |
| EDS                            | United States     | Services   |
| Fujitsu Korea                  | Japan             | Software and services                                    |
| Hewlett-Packard                | United States     | Software and services                                    |
| IBM                            | United States     | Software and services                                    |
| Informix                       | United States     | Software (DBMS)  |
| JOIS                           | Japan             | Services (database)                                      |
| Lexis/Nexis                    | United States     | Services (database)                                      |
| Microsoft                      | United States     | Software   |
| Nikkei Telecom                 | Japan             | Services (database)                                      |
| Novell                         | United States     | Software   |
| Oracle                         | United States     | Software (DBMS)  |
| Reuters                        | United Kingdom    | Services (database)                                      |
| Santa Cruz Operation (SCO)     | United States     | Software (DBMS)  |
| SHL Systemhouse, Inc.          | Canada            | Services (systems integration)                           |
| Sybase                         | United States     | Software (DBMS)  |
| Unisys                         | United States     | Software and services (systems integration)              |

Sources: INPUT  
 U.S. Department of Commerce  
 Various Media

Note the popularity of U.S. software in the South Korean market. Also noteworthy is the importance of U.S. vendors to the systems software market.

Exhibit 5 lists South Korean vendors that offer software or services in this market. This list is heavily biased toward software, database, and Internet access providers.

## Exhibit 5

**Representative South Korean Software and Services Vendors—1995**

| <b>Company Name</b>                               | <b>Offerings</b>                        |
|---|---|
| Consulting Software Group                         | Services                                |
| DACOM   | Services (DB, Internet access provider) |
| Daeshin Information & Communications              | Services (DB provider)                  |
| Hana Network                                      | Services (Internet access provider)     |
| Hangul  | Software                                |
| Hyundai Information Tech. Ltd.                    | Software (4GL), services                |
| Korea Foreign Trade Ass'n                         | Services (DB provider)                  |
| Korea PC Telecom                                  | Services (DB provider)                  |
| KORNET  | Services (Internet access provider)     |
| KREN (Korea Research & Education Network)         | Services (Internet access provider)     |
| KREONet (Korea Research Environment Open Network) | Services (Internet access provider)     |
| LG Software (Lucky Goldstar)                      | Software                                |
| Nong Shim Data System Co.                         | Software and services                   |
| NOWCOM  | Services (DB provider)                  |
| NuriNet   | Services (Internet access provider)     |
| Posdata Company, Ltd.                             | Services                                |
| Samsung Data Systems Co.                          | Services (DB provider)                  |
| Samsung Electronics                               | Software                                |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

## IT Spending

Exhibit 6 contains INPUT's estimate of 1995 IT spending in South Korea. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the Forecast Database.

IT expenditures for 1995 represent about 2.5% of South Korea's GDP. This level of spending for an information technology infrastructure underscores the commitment of the

Korean government and Korean businesses to the digital support of their global business activities.

Exhibit 6

1995 IT Spending—South Korea

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 900                                 | 8                      |
| Internal Staff       | 3,350                               | 30                     |
| Equipment            | 2,250                               | 20                     |
| Equipment Services   | 900                                 | 8                      |
| Facilities           | 1,000                               | 9                      |
| Information Services | 2,800                               | 25                     |
| Total IT Spending    | 11,200                              | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for South Korea, for the period 1995-2000.

## Exhibit 7

**Information Services Market  
South Korea, 1995-2000**

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| COUNTRY TOTAL              | 2,197      | 28%              | 2,814      | 3,612      | 4,631      | 5,960      | 7,683      | 9,898      | 29%            |
| Professional Services      | 325        | 25%              | 406        | 508        | 634        | 793        | 1,007      | 1,279      | 26%            |
| Systems Integration        | 170        | 32%              | 224        | 296        | 390        | 511        | 669        | 870        | 31%            |
| Outsourcing                | 305        | 27%              | 387        | 492        | 625        | 806        | 1,040      | 1,341      | 28%            |
| Processing Services        | 172        | 22%              | 210        | 256        | 312        | 378        | 457        | 553        | 21%            |
| Network Services           | 295        | 34%              | 395        | 530        | 710        | 960        | 1,295      | 1,740      | 35%            |
| Applications SW Products   | 420        | 28%              | 537        | 688        | 880        | 1,135      | 1,465      | 1,890      | 29%            |
| Systems SW Products        | 385        | 26%              | 485        | 611        | 770        | 962        | 1,200      | 1,500      | 25%            |
| Turnkey Systems            | 125        | 36%              | 170        | 231        | 310        | 415        | 550        | 725        | 34%            |

Source: INPUT







# Worldwide

## Information Services Program

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COUNTRY PROFILE

ASIA/PACIFIC

## Taiwan

December 1996

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### Economic Overview

Taiwan's real gross domestic product (GDP) has been growing at a remarkably steady rate over the last few years, and economists project that the stable growth—varying from 6.1% to 6.5% per annum—will continue through the end of this century. With inflation at a stable level of 3.5% to 3.7% per year for the same period, and unemployment at a low 1.6%, Taiwan's economic performance is the most stable of the countries that make up the Chinese Economic Area—the People's Republic of China, Hong Kong and Taiwan. With this performance, it is not surprising that Taiwan's incumbent president, Lee Teng-hui, was re-elected in March by a strong margin. The election, in many ways, was the logical end result of the three trends that have been driving the island for a decade or more—liberalization of Taiwan's economy, democratization through direct elections, and the growth and importance of the consumer. A major concern, Taiwan's relationship with China, seems to have reached some equilibrium, as both sides appear to want to avoid direct confrontation, and instead are seeking, through negotiations, to resolve many of their economic concerns. Of primary concern will be the establishment of effective, mutually beneficial relationships in areas such as telecommunications and financial interactions.

In the near term, Taiwan's economic efforts will concentrate on stimulating growth. As with most Asia/Pacific nations, an area of emphasis will be the continuing development of the financial, communications, energy and manufacturing infrastructure necessary for continued economic success in this highly competitive region. This effort will be aided by increased government spending resulting from a continued low inflation rate, and the end of the uncertainties that preceded the presidential election.

Key economic indicators for Taiwan are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—Taiwan

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1995                   | 6.1%  |
| - 1996                   | 6.3%  |
| Inflation Rate (1995)    | 3.7%  |
| Unemployment Rate (1995) | 1.6%  |
| Exchange Rate            | 27.51 |

Sources: GDP and Inflation Data, World Economic Outlook, IMF, 1996  
BofA World Information Services, 1996  
Exchange Rate, Wall Street Journal, 7/96

*Business Conditions* - A key factor in the future of Taiwan’s business community will be the country’s relationship with China. Overtures have already been made on both sides, and Taiwan’s Council for Economic Planning and Development has established a plan to become a more developed economy by 2006. The plan involves maintaining a GDP growth rate of 6.5% throughout that period, and increased (and improved) relationships with China. Taiwan is a strong investor in China, and Hong Kong has surpassed the U.S. as a market for Taiwanese goods. Both nations have strong trading backgrounds and a pragmatic approach to business. It is unlikely that ideological or political differences will impede for long the strong ties between the countries and the economic potential of the nations of the Chinese Economic Area.

One area of uncertainty is Taiwan’s ongoing ban on direct communications with the Chinese mainland. To date, most business activity has been funneled through Hong Kong. With that country reverting to China in July 1997, changes in or elimination of the ban will have to be considered very quickly. The method and end result of dealing with the ban will be a strong indication of how Taiwan proposes to proceed in its relationship with China. Given Taiwan’s level of investment in China, it is likely that Taiwan will resolve the problem in a satisfactory manner.

Information Services Market Forecast

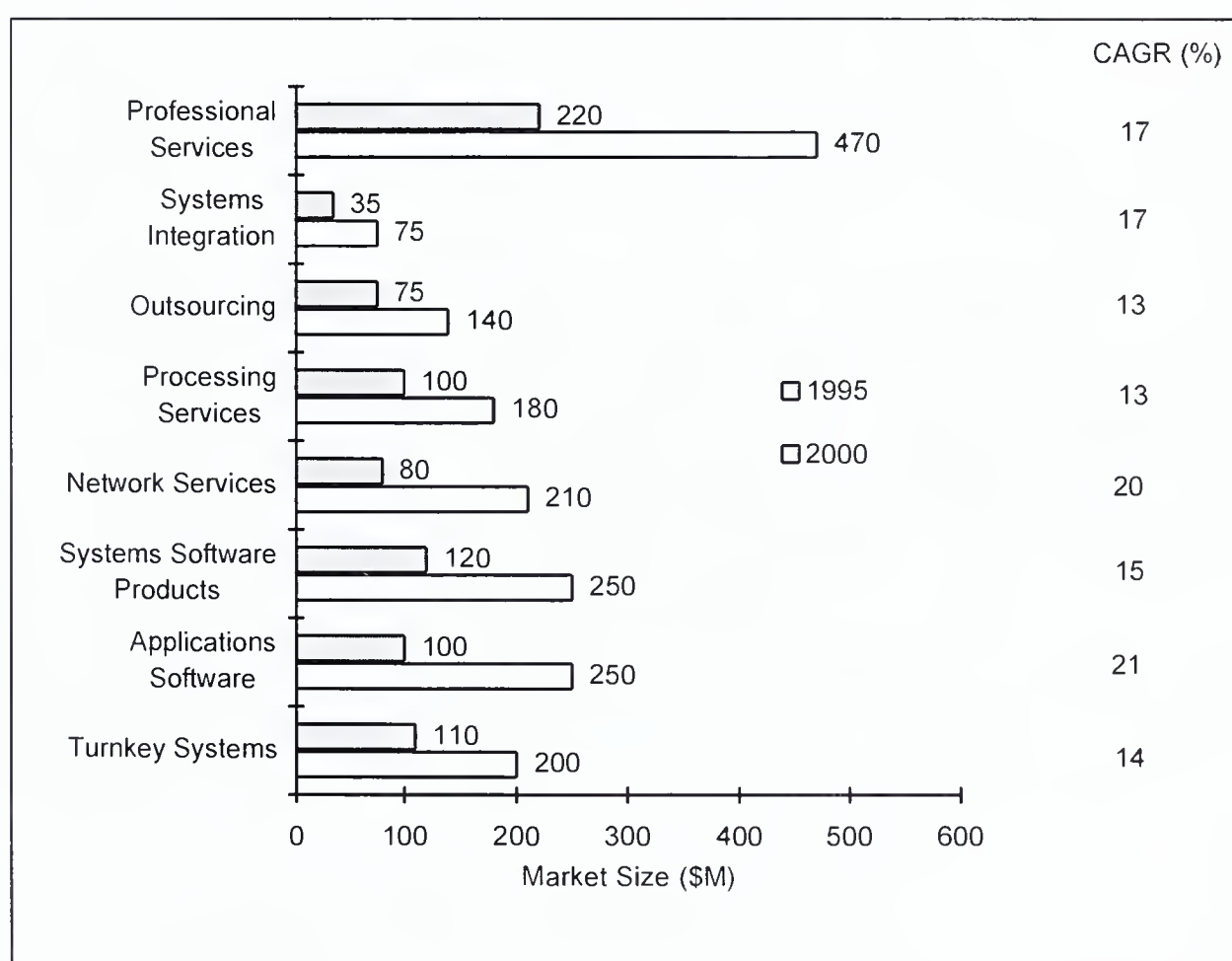
Taiwan’s information services market will grow from almost \$830 million in 1995 to more than \$1.7 billion in 2000—a compound annual growth rate (CAGR) of 16%. This growth rate places Taiwan in the middle grouping of Asia/Pacific nations, with a base market and

growth forecast very similar to those for Hong Kong. China's CAGR is greater (25%), but in the near term that rate is primarily a function of the small size of the base market.

Exhibit 2 summarizes INPUT's market forecast for Taiwan for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A detailed year-by-year forecast for each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
Taiwan, 1995 - 2000**



Numbers are rounded.

Source: INPUT

*Professional Services and Systems Integration* - These two product/service categories are growing at a consolidated rate of 17%, and together represent 30% of Taiwan's information services market in 1995, and 31% of the market in the year 2000. Growth in these market segments is driven by Taiwan's rock-steady economic growth initiatives, and since software is the IT lubricant that facilitates expanding business activities, the software development



(CAGR of 17%) and software products (CAGR of 25%) markets are the fastest growing segments of the professional services and systems integration (SI) product/service markets, respectively. IS consulting, especially in areas related to the continued expansion of Taiwan's IT and telecommunications infrastructure, will also be a strong market through the millennium. Major areas of opportunity for consulting and SI services are in continuing to develop Taiwan's industrial infrastructure, integrating diverse systems both domestically and internationally, and upgrading the IT environment through the application of distributed processing principles, client/server architecture, and global communications technology. Specific industries that need to expand and improve their functions include energy (power generation and distribution), telecommunications, environmental activities (pollution control), and transportation (airports, roads and ports). Taiwanese government agencies are also areas of opportunity, especially as interactions between Taiwan and China increase over the next decade. Wherever there is change, there is opportunity for information services—and most especially for consulting, planning and implementation activities that both facilitate change and take advantage of it; activities commonly grouped together under the terms “professional services” and “systems integration.”

*Outsourcing* - The outsourcing market in Taiwan is similar in size to that of Hong Kong, but growing at a somewhat slower rate due to the even pace of economic growth engineered by the government. Platform operations (where the vendor manages and operates the client's computer systems) will continue as the largest market, followed by the more recent concept of applications operations outsourcing, where the vendor is responsible for developing and/or maintaining the client's applications systems. These markets will grow at a 13% and 14% rate, respectively, through the end of this decade. Other outsourcing activities, such as network management, desktop services, applications management and business operations are, at the moment, a very small portion of Taiwan's outsourcing market, and not quantified in this analysis. As these markets develop, they will appear in future forecast matrices. The outsourcing market will grow from nearly \$75 million in 1995, to almost \$140 million in 2000, at a CAGR of 13%.

*Processing Services* - Processing services, like outsourcing, is growing at a 13% CAGR through 2000, with spending increasing from almost \$100 million in 1995 to over \$180 million at the millennium. Driven by the strong market for usage-sensitive transaction processing services for financial activities such as credit card clearings and demand deposit accounting, increased volumes resulting from growing use of the Internet for corporate purchases will also impel market growth. Spending for utility processing (CPU cycles and other resources purchased to satisfy unanticipated IT production needs) will remain steady at a 9% CAGR, while the growing concern for contingency (backup) processing facilities to be used in case of a disaster or other business interruption will drive spending for the “other” processing category.

*Network Services* - Global markets, the steadily increasing use of the Internet for business activities, and the popularity of on-line databases for a broad spectrum of information needs are trends driving the growing use of network services in Taiwan. With an overall CAGR of 20%, the network services market will grow from slightly more than \$80 million in 1995 to almost \$210 million in the year 2000. Electronic information service (e.g., on-line database) usage, the largest segment of this market in terms of dollar volume, will reach almost \$160 million by the millennium. Primary areas of database usage include economic and trade databases, news feeds, stock data from the various national exchanges, financial databases, and transportation data such as airline schedules. The potential for the Internet is focusing attention on new network applications, and from a relatively small base of \$15 million in 1995, this market is projected to grow to more than \$45 million by 2000—a CAGR of 26%, and the highest growth rate of all information services market segments for Taiwan.

*Systems and Applications Software Products* - Software products account for 27% of all information services spending in 1995; this proportion will grow to 28% by the year 2000, at an 18% CAGR. Systems software spending, especially heavy over the last few years for workstation/PC operating systems and database management systems (DBMS), will decline slightly to a steady 15% growth rate, as Taiwan's population of PCs continues to grow. Part of this increase is being driven by the success of Taiwan's Acer—one of the ten largest personal computer manufacturers in the world. In the first quarter of 1996, Acer shipped nearly a quarter-million PCs to the United States, and has just launched AcerBasic, a \$500 desktop PC aimed at providing affordable computers to developing countries. AcerBasic owes a significant portion of its low cost to Microsoft's willingness to discount its DOS 6.22, Windows 3.1 and "Works" suite of applications to Acer, for bundling with the AcerBasic platform. Acer also plans another offering, a new line of custom-made, application-specific, low-cost terminals for the corporate market with prices in the \$500 to \$1,000 range. Besides responding to the increasing sales of PC platforms, the systems software market is also being driven by the growing use of database managers (DBMS) from vendors such as Oracle and Microsoft.

In Taiwan, applications software products have found strong acceptance in traditional areas such as word processing, spreadsheet analysis and presentation graphics, and industry-specific applications in the government, energy, banking, insurance, consumer goods, transportation and telecommunications sectors continue to be in demand. The application software products market will grow at a 21% CAGR, from almost \$100 million in 1995 to over a quarter of a billion dollars in the year 2000.

*Turnkey Systems* - Taiwan's large manufacturing industry is a heavy user of function-specific turnkey systems, as are the telecommunications and energy industries. As low-cost PC-based turnkey systems become popular for such ubiquitous applications as human

resource management, Taiwan’s market for such platforms will grow at a 14% CAGR, from almost \$110 million in 1995 to more than \$200 million by the millennium. Modifications to standard offerings are necessary and expected in many markets, and the professional services subsector of the turnkey market (which is responsible for such modifications), will experience the fastest growth rate (20%) and have the largest expenditure base by the year 2000. Equipment, an area of declining costs and therefore declining turnkey market revenues, will grow at a modest 7%, while software products (15% CAGR), the “value-added” element, will roughly match the overall growth of the turnkey systems market.

*The Internet* - The Internet offers opportunities for expanded markets, increased business flexibility and, in many cases, reduced costs (when compared to private or dedicated network resources). Businesses in all the Asia/Pacific countries (and those in other regions) recognize these attributes and are aggressively exploring the potential of this new communications resource. Concerns regarding Internet security, traffic volumes, access, etc. are near-term in nature, are solvable with current technology, and should have no long-term effect on the rapid growth of this exciting new capability. Much of the growth in network services and the planning that takes place in professional services is Internet-related. Taiwan already has many Internet access providers and more will appear as this market continues to grow. Exhibit 3 notes a selection of the Taiwan-based vendors offering Internet access services.

Exhibit 3

**Taiwanese Internet Access Providers**

- Link-Ease Systems, Inc.
- Ministry of Education
- Pristine Internet Gateway
- SeedNet
- Transend Internet Co.

Source: U.S. Department of Commerce  
Best Internet Communications (Web Site)

*Software Piracy* - The protection of intellectual property rights is a concern throughout the Asia/Pacific region, and in Taiwan, as in other Asian nations, the protection of software copyrights and the prevention of software piracy are major issues. Since 1992, a series of laws have been passed protecting IPR and enforcement efforts have been improved. Partly as a result of these efforts, in 1994 the United States government moved Taiwan from the “priority watch list” to the “watch list” for copyright infractions under the Special 301 provision of the 1988 Trade Act. After further review in 1995, Taiwan remained on the



“watch list,” indicating a continuing concern with IPR violations, including software piracy. Because of the long-term importance of software products to the Chinese Economic Area and the efforts by software vendors to expand software product sales to include post-sales support (help desk), product updates, and documentation support—all of which will require a valid software product serial number—the level of piracy should decrease markedly over the next few years, as more local firms recognize the value of using registered software.

## Software and Services Vendors

The following table (Exhibit 4) provides a representative listing of firms providing information services in Taiwan.

Exhibit 4

### Representative Software and Services Vendors—Taiwan, 1995

| Company Name                          | Country of Origin | Offerings               |
|---------------------------------------|-------------------|-------------------------|
| Andersen Consulting                   | United States     | Services                |
| China Data Processing Center          | Taiwan            | Services                |
| China Management Systems              | Taiwan            | Services                |
| China Systems Corp.                   | Taiwan            | Software (Financial SW) |
| Concord Systems Management Corp.      | Taiwan            | Services                |
| Digital Equipment                     | United States     | Software and services   |
| EDS                                   | United States     | Services                |
| Galaxy Software Services              | Taiwan            | Software                |
| Golden Technology Company             | Taiwan            | Services                |
| Hewlett Packard                       | United States     | Software and services   |
| IBM                                   | United States     | Software and services   |
| International Integrated Systems Inc. | Taiwan            | Software                |
| Microsoft                             | United States     | Software                |
| NEC                                   | Japan             | Services                |
| Novell                                | United States     | Software                |
| Oracle                                | United States     | Software                |
| Reuters                               | United Kingdom    | Services                |
| RPT Intergroup Int'l Ltd.             | Taiwan            | Software and services   |
| Unisys                                | United States     | Software and services   |

Sources: INPUT  
U.S. Department of Commerce  
Various Media



The company name, country of origin, and an indication of offerings—software or services—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable.. Data is based upon 1995-1996 information.

U.S. hardware vendors such as IBM, Digital Equipment, Hewlett-Packard and Unisys offer the usual services (including systems integration) and software in support of their hardware products. Systems integrators include NEC, China Management Systems, Concord Systems Management Corp., Golden Technology Company, Andersen Consulting and EDS. Joint ventures are common—EDS’s partnering with China Management Systems, IBM with Concord Systems Management Group, and Hewlett-Packard with Golden Technology Company. IBM has also invested in International Integrated Systems, Inc., and the RPT Intergroup International, Ltd., is a Unisys VAR.

IT Spending

Exhibit 5 contains INPUT’s estimate of 1995 IT spending in Taiwan. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the Forecast Database.

Exhibit 5

1995 IT Spending—Taiwan

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 310                              | 9                      |
| Internal Staff       | 1,100                            | 32                     |
| Equipment            | 690                              | 20                     |
| Equipment Services   | 240                              | 7                      |
| Facilities           | 280                              | 8                      |
| Information Services | 830                              | 24                     |
| Total IT Spending    | 3,450                            | 100                    |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 6) for Taiwan, for the period 1995-2000.

Exhibit 6

### Information Services Market Taiwan, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 716        | 16%              | 828        | 961        | 1,117      | 1,301      | 1,515      | 1,769      | 16%            |
| <b>Professional Services</b>    | 186        | 16%              | 216        | 250        | 291        | 341        | 399        | 469        | 17%            |
| - IS Consulting                 | 49         | 14%              | 56         | 64         | 74         | 86         | 101        | 118        | 16%            |
| - Education & Training          | 15         | 13%              | 17         | 19         | 22         | 25         | 28         | 31         | 13%            |
| - Software Development          | 122        | 17%              | 143        | 167        | 195        | 230        | 270        | 320        | 17%            |
| <b>Systems Integration</b>      | 29         | 17%              | 34         | 40         | 46         | 54         | 63         | 74         | 17%            |
| - Equipment                     | 13         | 8%               | 14         | 16         | 18         | 21         | 24         | 28         | 15%            |
| - Software Products             | 3          | 67%              | 5          | 7          | 9          | 11         | 13         | 15         | 25%            |
| - Professional Services         | 2          | 0%               | 2          | 2          | 2          | 3          | 3          | 4          | 15%            |
| - Other                         | 11         | 18%              | 13         | 15         | 17         | 19         | 23         | 27         | 16%            |
| <b>Outsourcing</b>              | 65         | 12%              | 73         | 83         | 93         | 105        | 119        | 135        | 13%            |
| - Platform Operations           | 41         | 12%              | 46         | 52         | 58         | 65         | 74         | 84         | 13%            |
| - Applications Operations       | 24         | 13%              | 27         | 31         | 35         | 40         | 45         | 51         | 14%            |
| <b>Processing Services</b>      | 86         | 14%              | 98         | 111        | 126        | 143        | 161        | 181        | 13%            |
| - Transaction Processing        | 48         | 17%              | 56         | 65         | 75         | 86         | 98         | 111        | 15%            |
| - Utility Processing            | 22         | 9%               | 24         | 26         | 28         | 31         | 34         | 37         | 9%             |
| - Other Processing              | 16         | 13%              | 18         | 20         | 23         | 26         | 29         | 33         | 13%            |
| <b>Network Services</b>         | 68         | 19%              | 81         | 97         | 118        | 141        | 170        | 205        | 20%            |
| - Electronic Information Svcs   | 56         | 18%              | 66         | 78         | 95         | 112        | 133        | 158        | 19%            |
| - Network Applications          | 12         | 25%              | 15         | 19         | 23         | 29         | 37         | 47         | 26%            |
| <b>Applications SW Products</b> | 83         | 18%              | 98         | 118        | 142        | 172        | 208        | 252        | 21%            |
| <b>Systems SW Products</b>      | 105        | 16%              | 122        | 142        | 165        | 190        | 218        | 250        | 15%            |
| <b>Turnkey Systems</b>          | 94         | 13%              | 106        | 120        | 136        | 155        | 177        | 203        | 14%            |
| - Equipment                     | 43         | 7%               | 46         | 50         | 53         | 57         | 61         | 65         | 7%             |
| - Software Products             | 20         | 15%              | 23         | 26         | 30         | 34         | 39         | 46         | 15%            |
| - Professional Services         | 31         | 19%              | 37         | 44         | 53         | 64         | 77         | 92         | 20%            |

Source: INPUT





# Worldwide

## Information Services Program

COUNTRY PROFILE

ASIA/PACIFIC

## Japan

December 1996

### Economic Overview

After a very slow 1994 in which real economic growth was only 0.5%, the Japanese economy grew 0.9% in 1995 and is expected to increase 2.9% in 1996, with a leveling off to a sustainable 2.5% annual growth rate for the balance of the decade. Economic expansion is being driven by an increase in consumer spending and by additional private and public sector investments. The surge in public spending is expected to decrease in the near term, however, as a result of concerns regarding the budget deficit. The overall economic initiatives have been effective, however, and the Japanese economy is again moving in a positive direction. One near-term concern is that the recent strong economic growth will motivate Japan's central bank to implement tighter monetary policies, including raising interest rates, but this decision will almost certainly be deferred until late 1996 in order to more closely match any monetary policy changes to current economic conditions.

Key Japanese economic indicators are summarized in Exhibit 1.

Exhibit 1

#### Key Economic Indicators—Japan

| Indicator                | Value  |
|--------------------------|--------|
| GDP Growth Rate          |        |
| - 1995                   | 0.9%   |
| - 1996                   | 2.9%   |
| Inflation Rate (1995)    | -0.3%  |
| Unemployment Rate (1995) | 3.1%   |
| Exchange Rate            | 109.73 |

Sources: GDP and Inflation Data, World Economic Outlook, IMF, 1996  
Exchange Rates, Wall Street Journal, 7/96  
Unemployment Rate, INPUT Estimate



The inflation rate was marginally negative in 1995, but will increase to about 0.5% in 1996 and 1.0% to 2.0% for the balance of the decade—making it one of the lowest rates for any of the nations in the Asia/Pacific region. Unemployment is estimated at 3.1% for 1995—high for Japan and higher than in any of the Chinese Economic Area (CEA) nations. Japan's relatively high unemployment results from a number of factors: workforce reduction programs implemented by Japanese businesses to cope with increased foreign competition and higher labor costs; a shifting of many jobs to low-cost offshore production sites (such as Malaysia); a rebalancing of the labor force in which new jobs created by the improved economy are being filled at a slower rate than workforce reductions are adding to the pool of previously unemployed; and an overall change in Japanese business culture resulting in a movement away from the traditional “cradle to grave” employment philosophy. It is expected that these drivers will result in higher levels of unemployment in Japan than has been experienced in the past, for at least the rest of this millennium. Economic growth will be steady, however, and inflation will be held in check.

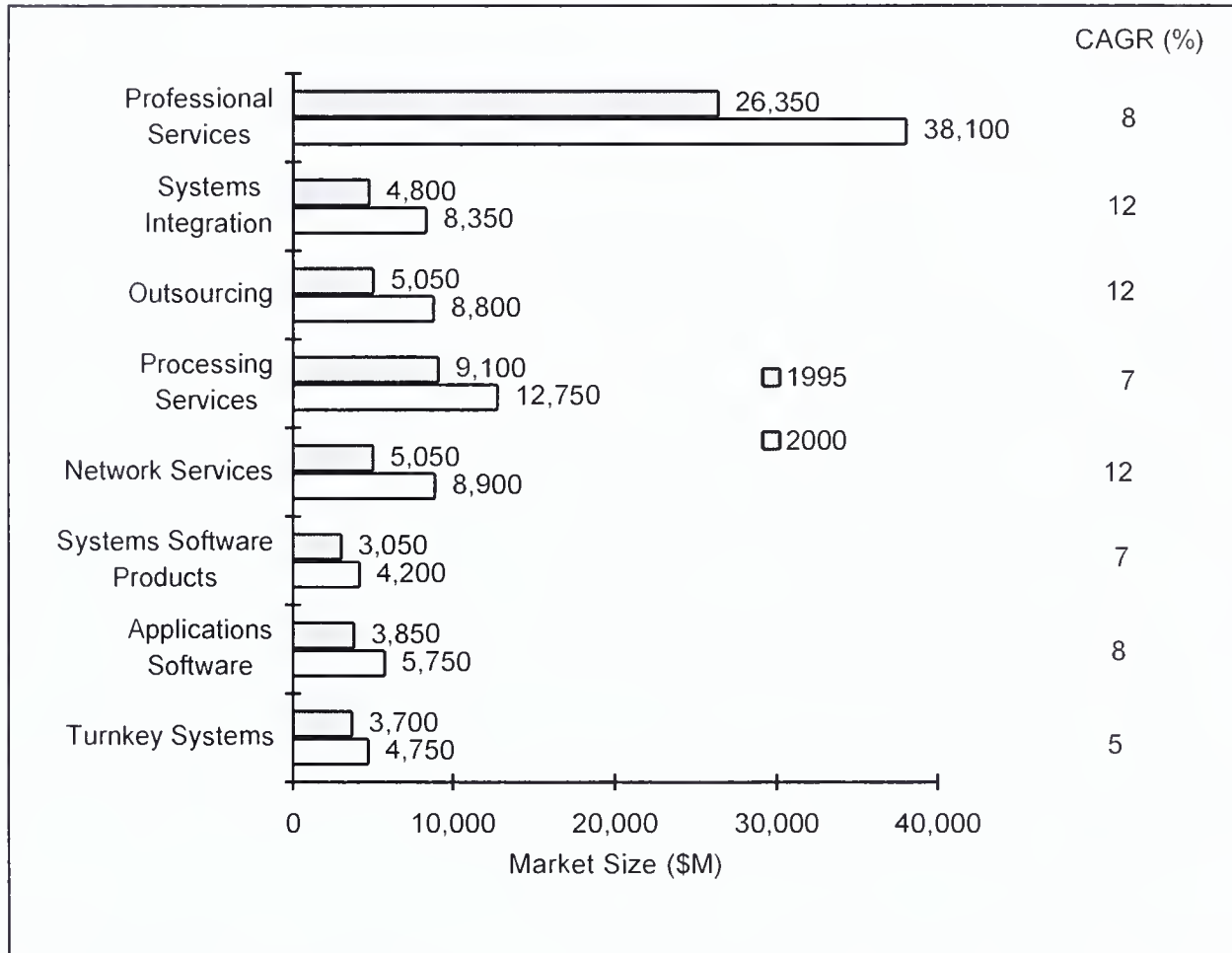
*Business Conditions* - Business conditions, in terms of revenues, profits and industry confidence, continue to improve, and there is every reason to believe that Japanese industry will continue to grow and expand for the balance of this decade. Much of the growth will occur because Japanese enterprises are now recognizing and implementing the changes necessary to compete more effectively against the foreign companies that embraced the Japanese industrial paradigm in the 1980s and early 1990s, and learned from and used this model to improve their own competitive positions. Japanese industry has been forced to change its business model and its willingness to do so has been, in part, responsible for the recent economic growth. An ongoing need among Japanese enterprises will be for reduction of excess assets—specifically, workforce reductions—that will bring labor and skill populations in line with business objectives. Information services, for example, offer a series of attractive choices for businesses that need to implement, deal with, or take advantage of change. Information services provide alternatives for IT production, allow an enterprise to return to core competencies while fixing IT costs, are the answer to gaining access to skills in very limited availability, and offer many firms the option to pay-as-you-go for needed resources rather than requiring major capital investments. These advantages are responsible, in part, for the recent strong growth of the Japanese information services market.

## **Information Services Market Forecast**

Exhibit 2 summarizes INPUT's market forecast for Japan for the eight information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A detailed year-by-year forecast for each product/service category is provided in the Forecast Database section.

## Exhibit 2

### Market Forecast by Product/Service Category Japan, 1995 - 2000



Numbers are rounded.

Source: INPUT

*Professional Services* - Professional services IT planning and implementation services, software development activities, and ability to provide technical training for workers whose functions have been altered or eliminated as a result of downsizing or cost-containment moves offer immediate solutions to the needs of the changing Japanese business environment. As such, this information services segment will grow at an 8% CAGR through the year 2000, from more than \$26.3 billion in 1995 to almost \$38.1 billion at the end of the decade. IS consulting will recover from essentially no growth in 1995 due to the sluggish economy, to the more steady increase of a 7% CAGR, as the Japanese economy rebounds and businesses seek the counsel of IT professionals in structuring their IT functions to meet changing business needs. Education and training will match IS consulting growth as businesses seek to provide training in IT functions for personnel whose responsibilities or functions have changed as a result of downsizing or enterprise reorganizations. Software development for enterprise-specific applications will continue to be the largest category of expenditures for Japanese information services. Although

Japanese businesses value packaged software, there is a continuing belief that internal or contractual development of company- and application-specific software solutions provides the best answer to application needs. It is this philosophy that tends to hold applications software product sales growth to the lowest level in the Asia/Pacific region, while custom software solutions abound and the professional services software development market continues to grow.

*Systems Integration* - Systems integration (SI), like professional services, thrives on change, and the changing Japanese business environment is motivating companies to seek an ally in the design, implementation and management of IT changes. Enter the systems integrator, offering single-point management and control of the transformations necessary for the achievement of company IT strategy, function and cost objectives. SI services are especially valuable for the network implementation and business integration activities resulting from the positioning of Japanese companies in the global marketplace. These benefits will drive the growth of SI activities at an aggressive 12% CAGR through the millennium—from a market of more than \$4.8 billion in 1995, to almost \$8.5 billion in 2000. Growth will be uniform throughout the three major categories of activity (equipment, professional services and software products), with spending for the “other” category (computer supplies, business support services, engineering services related to change, etc.) at a more modest 4% CAGR.

*Outsourcing* - Outsourcing is an effective means of both fixing IT costs and achieving IT objectives in a period of corporate redirection and restructuring and limited skill availability. It is also a vehicle for changing internal activity focus from required support functions to enterprise core competencies—a means of achieving competitive advantage in a global market. Critical corporate infrastructure resources are necessary, but they can often be better provided by a specialized, outside vendor—an outsourcer. Outsourcing in Japan will grow at a 12% CAGR, matching the two other high-growth areas—network services and systems integration. Although traditional platform operations will be the most heavily outsourced—representing almost 90% of the outsourcing market—there will be some growth in applications operations, and spending for network and applications management, desktop services and business operations will become more significant. Examples of recent outsourcing awards in Japan for other than platform or applications operations include Hewlett-Packard's network management contract with Shiseido (1995), and IBM's contracts with NTN (network management, 1995) and Seiko Epson (applications operations, 1996).

*Processing Services* - Processing services growth will diminish slightly over the forecast period, partly because of decreased volumes resulting from the anticipated tightening of monetary policy and partly due to anticipated higher levels of unemployment. Despite these factors, however, the transaction processing services market will remain steady, at a



lower level of growth, thanks in part to the financial community's use of transaction processing services for credit card debits and demand deposit accounting and the increasing use of on-line services for a broad spectrum of business activities. For instance, the growing popularity of the Internet as a vehicle for on-line business purchases is adding to transaction volumes. The use of utility processing services in Japan's highly sophisticated IT environment is decreasing as more applications migrate to small platform-based distributed environments, and other processing (essentially contingency processing or disaster recovery services) growth will decrease to 5% as companies balance risk-benefit-cost concerns. Given Japan's geographic position on the Pacific Rim's mobile tectonic plates and related earthquake concerns, spending for disaster recovery services will not fall below the 5% CAGR and will increase if another natural disaster raises corporate awareness.

*Network Services* - Network services will be the third largest information services market in Japan by the year 2000. Driven by the ever-increasing need for voice, data and video interaction in today's global market, this product/service category will grow from more than \$5 billion in 1995 to almost \$8.9 billion by the end of the decade—a CAGR of 12%, matching SI and outsourcing as the fastest growing information services markets in Japan. Steady growth will be seen in the use of electronic information services (EIS) databases, but the most significant increase in spending will occur for network applications—the vehicles for electronic commerce, facilitated by the growing capabilities of the Internet. Network applications growth was slow in 1995—only 4%—a result, in part, of the struggling economy in 1994 and 1995. The improved business environment in late 1995 and the strong start to 1996 will provide the impetus to develop and use more network applications in order to maintain or increase global competitive advantage.

*Systems and Applications Software* - Reflecting Japan's preference for unique software solutions to individual company needs, the combined Japanese applications and system software products market will grow at only a 7% CAGR—from \$6.9 billion in 1995 to almost \$10 billion by the millennium. Systems software sales by major manufacturers such as IBM and Fujitsu, and enterprise and PC-based applications products by vendors such as Microsoft, Oracle, SAP and Informix, will continue to drive this market, and most of these vendors have established a strong presence in the Japanese market by forming Japan-based subsidiaries or divisions to market and service their products. Systems software sales will be driven by the continued growth of the PC market and the use of DBMS; applications software will also be driven by the PC market, especially by demands for word processors, spreadsheets, accounting systems and personal productivity tools. Corporate IT will continue to implement enterprise-wide applications such as those offered by SAP, Baan, J.D. Edwards and others.



*Turnkey Systems* - The size of Japan's turnkey system market reflects the country's position as one of the major industrial nations. Turnkey systems are in heavy use in manufacturing environments, and are also popular for accounting, human resources, inventory, and financial applications for small institutions. As the economy reheats, so will the turnkey market; from a 4% growth rate and \$3.7 billion base in 1995, these integrated systems will grow at a 5% CAGR to almost \$4.8 billion in the year 2000. By the millennium, spending will be uniform across the equipment, software products and professional services categories, but the most dramatic growth will occur in professional services, where system modifications, enhancements and updates will account for the increased growth rate.

*The Internet* - The Internet offers opportunities for expanded markets, increased business flexibility and, in many cases, reduced costs (when compared to private or dedicated network resources). Businesses in the Asia/Pacific countries (and in other regions) recognize these attributes and are aggressively exploring the potential of this new communications resource. Concerns regarding Internet security, traffic volumes, access, etc. are near-term in nature, are solvable with current technology, and should have no long-term effect on the rapid growth of this exciting new capability. Much of the growth in network services and the planning that takes place in professional services is Internet related. Japan has a number of Internet access providers and more will appear as this market continues to grow. Exhibit 3 notes a selection of Japanese vendors offering Internet access services.

Exhibit 3

Japanese Internet Access Providers

| Company Name              |
|---------------------------|
| APICNET (Tokyo)           |
| GLOBAL ON-LINE JAPAN      |
| InfoWeb                   |
| Internet Initiative Japan |
| NEC Corporation           |
| NEC PC VAN                |
| Nifty Serve               |
| PSInet                    |
| TWICS (Tokyo)             |

Source: U.S. Department of Commerce  
Best Internet Communications (Web Site)

## Software and Services Vendors

The following table (Exhibit 4) provides a representative listing of some of the largest Japanese information services vendors, based upon estimates of 1995 revenues. Obtaining revenue data by line of business or business activity for Japanese companies or foreign firms doing business in Japan is extremely difficult. Such information is normally considered highly confidential and is not available for analysis. As a result, the companies in Exhibit 4 are listed in alphabetical order, rather than in order of information services revenues.

Exhibit 4

### Representative Japanese Information Services Vendors - 1995

|   |
|---|
| <ul style="list-style-type: none"><li>• CATENA Corporation</li><li>• CSK Corporation</li><li>• Fujitsu</li><li>• Hitachi Information Systems, Ltd.</li><li>• Hitachi Software Engineering Co., Ltd.</li><li>• JT Software Service Company, Ltd.</li><li>• Mitsubishi</li><li>• NEC Information Services, Ltd.</li><li>• Nippon Steel Information and Communications Systems, Inc.</li><li>• Nomura Research Institute, Ltd.</li><li>• NTT Data Communications Systems Corporation</li><li>• Toshiba Engineering Corporation</li></ul> |
|---|

Source: INPUT

Exhibit 5 contains a representative listing of foreign firms providing information services in Japan. The company name, country of origin, and an indication of offerings—software, services, or both—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Accordingly, none are offered here. Data is based upon 1995-1996 information.

Although most companies listed are U.S. based, or local subsidiaries of U.S. companies, virtually all major information services companies offer some products or services in the Japanese market. The companies noted here are a representative listing of foreign vendors with products and/or services that are globally well known and, as a result, generally well received in the Japanese market.

Exhibit 5

Representative Foreign Software and Services Vendors—Japan, 1995

| Company Name                   | Country of Origin | Offerings                      |
|--------------------------------|-------------------|--------------------------------|
| Andersen Consulting            | U.S.              | Services                       |
| Baan Co. N.V.                  | The Netherlands   | Software products              |
| CSC                            | U.S.              | Services                       |
| Compuware                      | U.S.              | Software products              |
| Digital Equipment Corp., Japan | U.S.              | Software products and services |
| Electronic Data Systems, Ltd.  | U.S.              | Services                       |
| IBM Japan, Ltd.                | U.S.              | Software products and services |
| Informix Japan                 | U.S.              | Software                       |
| J.D. Edwards & Co.             | U.S.              | Software                       |
| Microsoft Co., Ltd.            | U.S.              | Software                       |
| NCR Japan, Ltd.                | U.S.              | Software products and services |
| Nippon Unisys, Ltd.            | U.S.              | Software products and services |
| Novell                         | U.S.              | Software                       |
| Olivetti Corp. of Japan        | Italy             | Services                       |
| Oracle Corp., Japan            | U.S.              | Software                       |
| Reuters                        | U.K.              | Services                       |
| SAP Japan                      | Germany           | Software                       |
| Sun Microsystems, K.K.         | U.S.              | Software products and services |
| Unisys                         | U.S.              | Software products and services |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

IT Spending

The following table (Exhibit 6) offers INPUT’s estimate of 1995 IT spending in Japan. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the following section, Forecast Database.

## Exhibit 6

## 1995 IT Spending—Japan

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 21,100                              | 9                      |
| Internal Staff           | 79,800                              | 34                     |
| Equipment                | 46,950                              | 20                     |
| Equipment Services       | 11,750                              | 5                      |
| Facilities               | 14,100                              | 6                      |
| Information Services     | 61,000                              | 26                     |
| <b>Total IT Spending</b> | <b>234,700</b>                      | <b>100</b>             |

Numbers are rounded.

Source: INPUT

IT spending increased more than 20% in 1995, driven by the newly healthy economy and business expectations of continued economic growth. The result of these conditions is a freeing of the capital investment and corporate infrastructure improvements that were placed on hold during the recent period of economic turmoil and fiscal uncertainty. Information services spending, as a percentage of total IT spending, grew from 23% in 1994 to 26% in 1995. This increase was due not only to the growth of new businesses and the expansion of established enterprises, but also to a shift in spending—away from fixed, internal, burdened cost centers, and to external, contracted or usage-sensitive cost elements. Downsizing and cost and profit concerns are driving favorable consideration of IT-related services and software products and services. As in the United States, businesses are more often finding that information services offer the most functional and least-cost solution to business IT needs.

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for Japan, for the period 1995-2000.



## Exhibit 7

**Information Services Market  
Japan, 1995-2000**

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 56,152     | 9%               | 61,016     | 64,938     | 72,937     | 79,042     | 87,976     | 91,574     | 8%             |
| <b>Professional Services</b>    | 24,540     | 7%               | 26,359     | 28,183     | 31,070     | 33,514     | 36,862     | 38,094     | 8%             |
| - IS Consulting                 | 1,620      | -1%              | 1,608      | 1,691      | 1,864      | 2,011      | 2,175      | 2,209      | 7%             |
| - Education & Training          | 1,006      | 5%               | 1,054      | 1,127      | 1,212      | 1,274      | 1,364      | 1,486      | 7%             |
| - Software Development          | 21,914     | 8%               | 23,697     | 25,365     | 27,994     | 30,229     | 33,323     | 34,399     | 8%             |
| <b>Systems Integration</b>      | 4,323      | 11%              | 4,820      | 5,131      | 5,907      | 6,639      | 7,654      | 8,334      | 12%            |
| - Equipment                     | 1,535      | 10%              | 1,692      | 1,785      | 2,044      | 2,291      | 2,625      | 2,842      | 11%            |
| - Software Products             | 445        | 8%               | 482        | 503        | 579        | 637        | 712        | 767        | 10%            |
| - Professional Services         | 2,231      | 14%              | 2,545      | 2,740      | 3,166      | 3,605      | 4,202      | 4,600      | 13%            |
| - Other                         | 112        | -10%             | 101        | 103        | 118        | 106        | 115        | 125        | 4%             |
| <b>Outsourcing</b>              | 4,548      | 11%              | 5,064      | 5,260      | 6,053      | 6,877      | 8,094      | 8,791      | 12%            |
| - Platform Operations           | 4,057      | 11%              | 4,522      | 4,713      | 5,436      | 6,203      | 7,317      | 7,973      | 12%            |
| - Applications Operations       | 491        | 10%              | 542        | 547        | 617        | 674        | 777        | 818        | 9%             |
| <b>Processing Services</b>      | 8,254      | 10%              | 9,091      | 9,545      | 10,794     | 11,461     | 12,493     | 12,729     | 7%             |
| - Transaction Processing        | 7,025      | 11%              | 7,764      | 8,238      | 9,369      | 10,005     | 10,981     | 11,214     | 8%             |
| - Utility Processing            | 404        | 6%               | 427        | 410        | 443        | 436        | 400        | 382        | -2%            |
| - Other Processing              | 825        | 9%               | 900        | 897        | 982        | 1,020      | 1,112      | 1,133      | 5%             |
| <b>Network Services</b>         | 4,604      | 10%              | 5,065      | 5,390      | 6,199      | 6,876      | 7,918      | 8,882      | 12%            |
| - Electronic Information Svcs   | 2,348      | 16%              | 2,725      | 2,857      | 3,248      | 3,555      | 4,054      | 4,521      | 11%            |
| - Network Applications          | 2,256      | 4%               | 2,340      | 2,533      | 2,951      | 3,321      | 3,864      | 4,361      | 13%            |
| <b>Applications SW Products</b> | 3,425      | 12%              | 3,844      | 4,221      | 4,887      | 5,138      | 5,894      | 5,769      | 8%             |
| <b>Systems SW Products</b>      | 2,864      | 7%               | 3,051      | 3,182      | 3,647      | 3,873      | 4,223      | 4,212      | 7%             |
| <b>Turnkey Systems</b>          | 3,594      | 4%               | 3,722      | 4,026      | 4,380      | 4,664      | 4,838      | 4,763      | 5%             |
| - Equipment                     | 1,154      | -1%              | 1,143      | 1,188      | 1,243      | 1,292      | 1,306      | 1,267      | 2%             |
| - Software Products             | 1,448      | 4%               | 1,500      | 1,598      | 1,680      | 1,763      | 1,814      | 1,767      | 3%             |
| - Professional Services         | 992        | 9%               | 1,079      | 1,240      | 1,457      | 1,609      | 1,718      | 1,729      | 10%            |

Source: INPUT



# Worldwide

## Information Services Program

COUNTRY GROUPING

ASIA/PACIFIC

## Other Asia/Pacific

December 1996

### Geographic Area Definition

The "other" Asia/Pacific country grouping consists of the smaller, less developed ASEAN nations, including Indonesia, Malaysia, the Philippines and Thailand. The countries in this grouping are considered "emerging" nations and generally viewed as the next wave of nations in Asia to take their place as important world economies. China, once included in this group, is starting to receive attention as a potential major player in global business activities, and is now covered in its own country profile as part of the Asia/Pacific region. The four nations noted above are the major economic entities in this area and are the focus of this regional profile.

### Economic Overview

Key economic indicators for the four major Other Asia/Pacific countries are summarized in Exhibit 1, followed by an economic and business summary for each nation.

Exhibit 1

**Key Economic Indicators—Other Asia/Pacific Countries**

| Country     | GDP Growth Rate |      | Inflation Rate (1995) | Unemployment Rate | Exchange Rate |
|-------------|-----------------|------|-----------------------|-------------------|---------------|
|             | 1995            | 1996 |                       |                   |               |
| Indonesia   | 8.1%            | 7.8% | 9.0%                  | 4.0%              | 2326.60       |
| Malaysia    | 9.6%            | 8.7% | 3.6%                  | 2.8%              | 2.50          |
| Philippines | 4.8%            | 5.4% | 10.9%                 | 12.0%             | 26.20         |
| Thailand    | 8.6%            | 8.5% | 5.8%                  | N/A               | 25.40         |

Sources: GDP, Inflation and Unemployment Data: BofA World Information Services, 1996  
Exchange Rates, Wall Street Journal, 6/96

A common attribute of most of these countries is their comparatively low labor rates, which have allowed them to become assembly sites for their prosperous Asian neighbors who must rely on cheaper offshore labor to remain competitive in world markets. The abundant technical assembly skill sets and advantageous labor rates make these economies especially suitable for the offshore assembly of small electronics.

*Indonesia* - Indonesia's stable economic policies will continue to drive a GDP growth rate in the 7% to 8% range through the end of this century. Near term, the 8.1% GDP growth seen in 1995 will be down slightly to 7.8% for 1996 and to an estimated 7.5% for 1997. Inflation, at 9% for 1995, will be in the range of 8% for the next two to three years, despite tight monetary policies. Investment spending will continue to strong, driven by both internal revenue sources—generated by sound monetary policies and a high rate of domestic saving—and foreign capital. Unemployment, although high by regional standards, is steadily decreasing, but a recent increase in the minimum wage has had a dampening effect on employment increases, although it has been favorably received by labor. Even with the wage increase, however, Indonesia's labor rates are still low by regional standards and should continue to provide a competitive advantage for manufacturing and assembly operations through the millennium.

Business, long term, is benefiting from the stable environment, the influx of foreign capital, a skilled labor force and the government's \$55 billion investment plan to improve the Indonesian infrastructure by the year 2000. The bulk of this investment (\$25 billion) will be spent on development of energy sources and distribution infrastructure; \$7 billion is earmarked for telecommunications improvements; the balance is for improvements in transportation assets such as highways and airports. Opportunities exist for information services vendors to participate both in the steady growth of Indonesia's business environment and the development of the national infrastructure that will allow this economy to evolve into a more vertically integrated business environment—one in which Indonesian firms manufacture the components used in the various assembly processes, rather than just assembling the products of offshore firms.

*Malaysia* - Malaysia is a growing economy, with a 9.6% GDP growth in 1995, declining to 8.7% in 1996 and remaining in the 7.8% range for the next few years. This growth, coupled with low inflation and unemployment rates, is a result of the recent investments that are upgrading and expanding the country's manufacturing resources and improving the economic infrastructure. The rapid pace of investment growth is forcing the government to apply brakes to the economy, with the intent of reducing the forces driving the upward trend in labor and business costs. The rapid expansion of this economy has placed strains on the labor market (e.g., low unemployment), and the Malaysian government now plans to improve the skill sets of workers through education and training programs designed to



produce the expertise needed for future growth. Additional resources in areas of limited skill availability will also help to hold down labor costs—a concern in a region that currently enjoys a huge economic advantage due to low labor rates, and wants to retain that competitive edge and not see it erode as a result of the higher rates demanded by scarce resources.

Tightened economic controls will result in restraints on business growth, limiting it to a slower pace than seen in past years, but still expanding at a steady and more sustainable rate. Malaysia's planned spending for economic and infrastructure improvements is at \$200 billion for the period 1995-2000, with allocations similar to those seen for Indonesia—energy supply, transportation, and manufacturing resources. The construction activity related to this infrastructure improvement will favor growth in Malaysia's discrete manufacturing, process manufacturing (petroleum products), utilities (energy) and transportation industry sectors. Putrajaya, the new capital of Malaysia to be constructed near Kuala Lumpur, is intended to be a showcase business center that will attract the foreign firms that will help to expand Malaysia's information technology presence among the ASEAN nations. Opportunities for information services vendors in the Malaysian market are attractive because of the changes and aggressive growth planned for its economy. Information services will find many opportunities in support of Malaysian IT resources, to help choose a solution or facilitate the changes necessary to achieve economic and business objectives.

*The Philippines* - Economic growth for the Philippines is the lowest for any of the countries in this group of ASEAN nations. At 4.8% for 1995 and 5.4% for 1996, with a high inflation rate of 10.9% and unemployment at 12%, it is hard to imagine that this is a growing and expanding economy. After the political "soap opera" of the Marcos era—1970s and 1980s—the current Ramos administration has been able to establish and maintain a recovery that allows optimistic projections of steady GDP growth through the millennium. Driving the growth is a strong investment program, supported by foreign moneys attracted by the newly stable economy. Freeing the economy to participate in increased competition through deregulation is also stimulating the business environment, and lower interest rates should also be a stimulant to growth. Economic growth will reduce unemployment as increased business activity absorbs portions of the idle labor force. Unemployment in 1996 is expected to be about 11% or less, and should decline further through the next four years.

Business conditions will continue to improve over the balance of this decade, as freer competition, lower interest rates, increased foreign investment and a more fully employed labor force combine to provide a climate of growth and opportunity. Industrial activity will improve as a result of government emphasis on and support of major industrial parks, which have attracted investors from the U. S., Australia, Taiwan, Japan and the U.K. Cessation of hostilities with the Moslem Moro National Liberation Front (a concern for



those who remember similar periods of unrest in the post-WWII Philippines, when the nationalist Huks disrupted business activity and foreign presence was not welcomed) will also be a stimulus to business growth, as will privatization programs and an opening of the retail market to direct sales by foreign vendors. Information services vendors will see opportunities in support of the Philippine government and businesses in the utility, retail, manufacturing (both discrete and process), and telecommunications industries.

*Thailand* - Of the four nations discussed in this profile, Thailand continues to experience the highest level of unrest—driven, in part, by its continuing political turmoil that has tended to produce short-term reactions rather than long-term plans and agendas. Regardless, Thailand's GDP growth has been solid at 8.6% in 1995, and is expected to continue at 8.5% in 1996 and decrease slightly to approximately 8% by 1999. Inflation is at a containable 5.8% and will decrease to a low 4% by 1999. Reliable current unemployment figures are not available, but in 1993 the published figure was 3.2%. Strong economic growth is expected to continue through the end of this decade, driven by government investment in rural areas and infrastructure, and foreign investment in industry. A key area of concern is the shortage of technical skills in key industrial and service areas. In reaction, the government is emphasizing training programs in these areas as part of its current Five-Year Plan and is allowing more foreigners to enter the labor force.

Business conditions in Thailand should continue on a positive note through the end of this decade, driven by infrastructure improvement programs (similar to those in the other three nations discussed in this profile) aimed at the energy, telecommunications, manufacturing and transportation industry sectors. Privatization will especially favor the energy and telecommunications sectors as the government seeks reliable vendors to license to develop these key resources. Manufacturing activities are expected to move from small components and assemblies to higher-end products such as automobiles and complex electronics. These growth areas, similar to those of the other three nations noted earlier, offer opportunities for information services vendors to support the growth of the domestic and foreign businesses in Thailand that are responding to the economic plans of this nation.

## Information Services Market Forecast

*ASEAN Information Services Overview* - The ASEAN group of nations has been identified as an area of major economic activity and opportunity for the next decade or more. The generally low labor rates have made this region the assembly point of choice for countries such as Japan, which benefit from their lower labor rates for component assembly operations. But the four nations covered in this profile are looking to a brighter future of broader economic activity where, driven by both domestic and foreign investments, fully integrated manufacturing activities, sophisticated telecommunications resources, world-class transportation facilities and access to global financial resources can place them on an

economic par with their other ASEAN partner—Singapore—and the more industrialized Asia/Pacific countries, such as Japan, South Korea and Taiwan. This is a long-term goal, not to be realized in this century, but obtainable in the early 21st century, as these smaller ASEAN nations follow the path identified by South Korea. Fueled by investment capital and nourished by a more stable economic and political environment, these countries will move into economic prominence in the next century, and represent an area of opportunity for information services businesses that can help them chart the path to their future. The advantage to information services and software product vendors of doing business in the ASEAN markets (represented by the four countries discussed in this profile) is that the countries tend to have similar technology, skill and infrastructure challenges, and solutions developed for one area will have applicability (in whole or in part) elsewhere—thus vendors can leverage their investment in problem analysis and applications and product development.

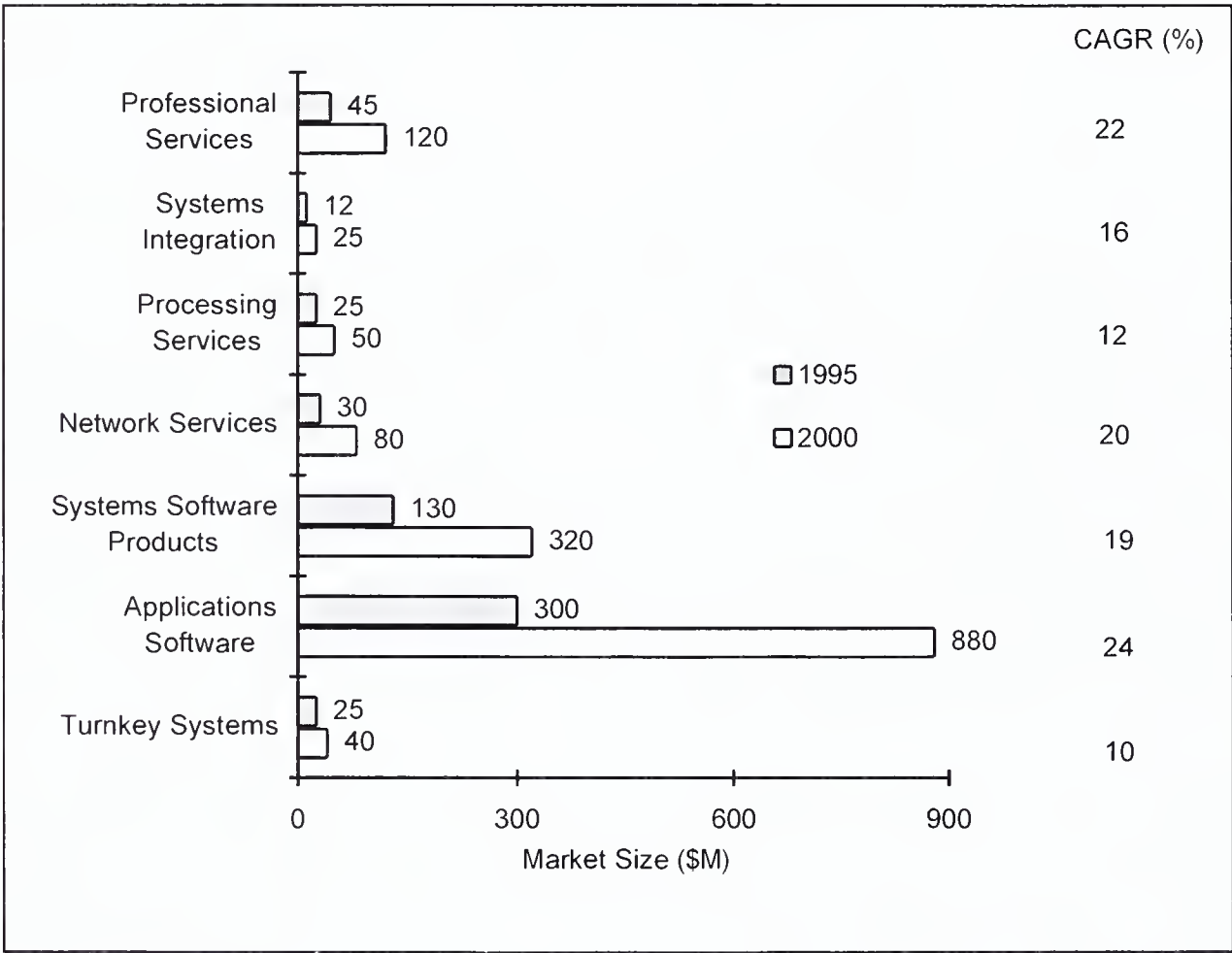
*Other Asia/Pacific Information Services Market Forecast* - Other Asia/Pacific's information services market will grow from \$570 million in 1995 to more than \$1.5 billion in 2000—a compound annual growth rate (CAGR) of 21%. This growth rate places Other Asia/Pacific as the fourth fastest growing of the ten markets sized in the Asia/Pacific region, behind India, South Korea and China.

Exhibit 2 summarizes INPUT's market forecast for Other Asia/Pacific for the seven information service categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A year-by-year forecast for each product/service category is provided in the Forecast Database section.

*Professional Services and Systems Integration* - The market for professional services and systems integration (SI) is expanding at a combined compound annual growth rate of 21%—from over \$55 million in 1995 to almost \$150 million in the year 2000. This growth is being driven by the IT consulting, custom software, integration and expansion functions necessary to support the growth of country infrastructure and business activities. Professional services growth will be at a 22% CAGR, with a base of more than \$120 million by the millennium. SI growth will be at a slightly slower pace—16% CAGR—reflecting the less complex IT environment from which near-term technological growth will occur in the Other Asia/Pacific market. As implemented IT systems evolve to become more complex, or there is a requirement to integrate disparate systems or technologies, the demand for SI support will increase, and users will seek the benefits of SI participation in facilitating changes in their IT environments.

Exhibit 2

Market Forecast by Product/Service Category  
Other Asia/Pacific, 1995 - 2000



Numbers are rounded.

Source: INPUT

*Processing Services* - The processing services market will grow from more than \$25 million in 1995 to almost \$50 million by 2000, at a CAGR of 12%. The majority of activity will be for financial services such as credit card processing and demand deposit clearings, with activity also in the areas of insurance, health services and payroll processing. Almost all spending in this market is for transaction processing services, with very little activity for utility or other (contingency) processing services

*Network Services* - Driven by the growing availability of on-line databases, the popularity of the Internet, and the general desire by the ASEAN nations to improve both their telecommunications infrastructure and the business communications capabilities of indigenous businesses, the network services market for the Other Asia/Pacific nations will grow at a 20% CAGR from more than \$30 million in 1995 to almost \$80 million in 2000. The growth rate would be even higher, but before network applications can increase or electronic information services (EIS) can be widely used, the communications



infrastructure must be in place to permit such activities. The countries profiled in this report are addressing this need through government initiatives aimed at improving the communications infrastructure, but more aggressive growth will wait upon the necessary telecommunications enhancements—including improved geographic coverage, better reliability and the enhanced function/feature capabilities needed for network applications (e.g., 28.8 BPS “clean” local line speeds for fast transfer of the on-line graphics so common at Web sites). Most spending in this market will be for on-line databases (trade, medical, financial, news, etc.) and proprietary networks supporting financial services and other remote-transaction-intensive applications.

*Applications and Systems Software Products* - Collectively, spending in these two software markets will grow from almost \$430 million in 1995 to nearly \$1.2 billion in the year 2000—a CAGR of 23%. Software products will account for 75% of total information services spending in 1995 and 79% of spending in the year 2000. Systems software products (DOS, Windows, OS/2, DBMS) and applications products aimed at the rapidly growing workstation/PC market (word processors, spreadsheets, industry-specific applications, and communications software) are almost all imported from foreign countries, and there is a strong preference for U.S. software products from companies such as Microsoft, IBM, Oracle, Unisys, JB Systems and Hewlett-Packard. Local software companies also provide some products, primarily for applications. A sampling of both foreign and domestic software vendors is included as Exhibit 4 in the Software and Services Vendors section of this profile. Although the internal programming resources of these ASEAN nations are growing and becoming more skilled, foreign software products will continue to be the most popular offerings well into the next millennium. Industries with application areas offering growth opportunities are those associated with common government-sponsored infrastructure improvements, such as telecommunications improvements, energy development and management, transportation (seaport, airport, and highway construction and management), and financial, insurance, and banking activities.

*Turnkey Systems* - The turnkey systems market will grow from slightly more than \$25 million to over \$40 million in 2000, at a CAGR of 10%. Modest by comparison to other product/service categories, this growth reflects the small population of application-specific platforms common to nations with limited industrial capacity. Because cheap labor is one of the key assets of the four nations noted in this profile, manual labor rather than automated or numerically controlled resources is common. As these nations become more industrialized and labor rates increase, spending for turnkey systems will also increase. Major application areas for installed systems include accounting, financial analysis, health care, local reservation and dealership management, and inventory systems.

*The Internet* - The Internet offers opportunities for expanded markets, increased business flexibility and, in many cases, reduced costs (when compared to private or dedicated



network resources). Businesses in the ASEAN and other Asia/Pacific countries (and those in other regions) recognize these attributes and are aggressively exploring the potential of this new communications resource. Concerns regarding Internet security, traffic volumes, access, etc., are near term in nature, are solvable with current technology, and should have no long-term effect on the rapid growth of this exciting new capability. Much of the growth in network services and the planning that takes place in professional services are Internet-related. The “other” Asia/Pacific nations already have a number of Internet access providers and more will appear as this market continues to grow. Exhibit 3 notes a selection of the vendors in the Other Asia/Pacific area offering Internet access services.

Exhibit 3

Other Asia/Pacific Internet Access Providers

| Country and Company Name               | Country of Origin |
|--|-------------------|
| <i>Indonesia</i>                       |                   |
| Indo Internet                          | Indonesia         |
| PT IndoInternet                        | Indonesia         |
| The Asia Pacific Internet Co., Ltd.    | Australia         |
| University of Indonesia                | Indonesia         |
| <i>Malaysia</i>                        |                   |
| JARING                                 | Malaysia          |
| The Asia Pacific Internet Co., Ltd.    | Australia         |
| <i>The Philippines</i>                 |                   |
| EMAIL CENTRE                           | The Philippines   |
| <i>Thailand</i>                        |                   |
| A-Net Co., Ltd.                        | Thailand          |
| Asian Institute of Technology          | Thailand          |
| KSC Commercial Internet Co.            | Thailand          |
| Computer Communication Access for NGOS | Thailand          |
| Thaisarn Internet Service at NECTEC    | Thailand          |
| <i>Vietnam</i>                         |                   |
| NetNam                                 | Vietnam           |

Source: U.S. Department of Commerce  
Best Internet Communications (Web Site)

*Software Piracy* - The protection of intellectual property rights is a concern throughout the Asia/Pacific region, and in the Other Asia/Pacific countries, as in other Asian nations, the protection of software copyrights and the prevention of software piracy are major issues.

## Software and Services Vendors

Exhibit 4 (on the next page) provides a representative listing of firms providing information services to the Other Asia/Pacific nations. The company name, country of origin, and an indication of offerings—software or services—are provided. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Data is based upon 1995-1996 information.

## IT Spending

Exhibit 5 contains INPUT's estimate of 1995 IT spending in Other Asia/Pacific. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category.

Exhibit 5

### 1995 IT Spending—Other Asia/Pacific

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 130                                 | 4                      |
| Internal Staff           | 910                                 | 27                     |
| Equipment                | 970                                 | 29                     |
| Equipment Services       | 370                                 | 11                     |
| Facilities               | 400                                 | 12                     |
| Information Services     | 570                                 | 17                     |
| <b>Total IT Spending</b> | <b>3,350</b>                        | <b>100</b>             |

Numbers are rounded.

Source: INPUT

## Exhibit 4

**Representative Software and Services Vendors—Other Asia/Pacific, 1995**

| <b>Country and Company</b>    | <b>Country of Origin</b> | <b>Offerings</b>       |
|-------------------------------|--------------------------|------------------------|
| <b><i>Indonesia</i></b>       |                          |                        |
| Andersen Consulting           | United States            | Services               |
| Autodesk                      | United States            | Software               |
| Digital Equipment             | United States            | Software and services  |
| Hewlett-Packard               | United States            | Software and services  |
| IBM                           | United States            | Software and Services  |
| Microsoft                     | United States            | Software               |
| NEC                           | Japan                    | Services               |
| Oracle                        | United States            | Software               |
| Unisys                        | United States            | Software and services  |
| <b><i>Malaysia</i></b>        |                          |                        |
| Andersen Consulting           | United States            | Services               |
| Digital Equipment             | United States            | Software and services  |
| EDS                           | United States            | Services               |
| Unisys                        | United States            | Software and services  |
| <b><i>Thailand</i></b>        |                          |                        |
| Andersen Consulting           | United States            | Services               |
| Compunet                      | United States            | Services               |
| Digital Equipment             | United States            | Software and services  |
| EDS                           | United States            | Services               |
| Hewlett-Packard               | United States            | Software and services  |
| Multimedia Creations          | Thailand                 | Software (multimedia)  |
| Oracle                        | United States            | Software               |
| Shinwatra Datacom             | Thailand                 | Services (networks)    |
| SunSoft                       | United States            | Software and services  |
| Thaisoft                      | Thailand                 | Software (distributor) |
| Unisys                        | United States            | Software and services  |
| <b><i>The Philippines</i></b> |                          |                        |
| Andersen Consulting           | United States            | Services               |
| Baan International            | The Netherlands          | Software               |
| Beslutmodeller Ab             | Sweden                   | Software               |
| Digital Equipment             | United States            | Software and services  |
| FASTech                       | Singapore                | Software               |
| IBM                           | United States            | Software and services  |
| JB Systems                    | United States            | Software               |
| Microsoft                     | United States            | Software               |
| Pinnacle Developments, Ltd.   | New Zealand              | Software               |
| Tsukiden Software             | The Philippines          | Software               |
| Unisys                        | United States            | Software and services  |
| Vedeka Software Int'l         | India                    | Software               |

Sources: INPUT  
U.S. Department of Commerce  
Various Media

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 6) for the Other Asia/Pacific country grouping, for the period 1995-2000.

Exhibit 6

### Information Services Market Other Asia/Pacific, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| AREA TOTAL                 | 472        | 21%              | 570        | 688        | 832        | 1,011      | 1,232      | 1,509      | 21%            |
| Professional Services      | 37         | 22%              | 45         | 55         | 67         | 82         | 100        | 121        | 22%            |
| Systems Integration        | 10         | 20%              | 12         | 14         | 16         | 19         | 22         | 25         | 16%            |
| Processing Services        | 25         | 8%               | 27         | 30         | 34         | 38         | 43         | 48         | 12%            |
| Network Services           | 26         | 19%              | 31         | 37         | 44         | 53         | 64         | 78         | 20%            |
| Applications SW Products   | 240        | 23%              | 296        | 362        | 446        | 555        | 695        | 879        | 24%            |
| Systems SW Products        | 110        | 21%              | 133        | 161        | 193        | 229        | 270        | 317        | 19%            |
| Turnkey Systems            | 24         | 8%               | 26         | 29         | 32         | 35         | 38         | 41         | 10%            |

Source: INPUT











# Worldwide

## Information Services Program

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REGIONAL PROFILE

EUROPE

## Europe

September 1996

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### Economic Overview

In many European countries, where economic recoveries have only recently become well established, the general mood has improved sharply during the past year. This appears to have contributed to buoyant household spending patterns in some countries. It is estimated that household spending will strengthen steadily as savings ratios fall, despite the fact that the latter are in some cases already low by historical comparison.

Recovery has been somewhat stronger than that predicted by the Organization for Economic Cooperation and Development (OECD). Confidence rose sharply in the second half of 1994 in both household and business sectors and employment has already started to recover.

A strong rise in business investment is projected, largely as a response to an improving economic environment. It is thought that, long-term, interest rates will not adversely affect business investment to a significant degree in Europe, where investment intentions are improving and profitability is good.

In Germany, France, and other European countries, economic growth has resumed. However, the current *disinflationary* momentum may not be sufficient to stall inflationary pressures and the recovery may yet stall. The extent of disinflation—due to low wage settlements, high productivity gains, and intense competition—has been much stronger than had been expected by forecasters. Of the four major economies, Germany has grown fastest (by an average of 2.8% a year) as unification gave a massive boost to domestic demand.

Key economic indicators for Europe are summarized in Exhibit 1. Inflation is the average projected for the period 1995-2000.



## Exhibit 1

**Key Economic Indicators—Europe**

| Indicator       | Value |
|-----------------|-------|
| GDP Growth Rate |       |
| - 1995          | 3.0%  |
| - 1996          | 3.2%  |
| Inflation Rate  | 2.6%  |

Sources: GDP and Inflation Data, OECD, 1994

**Information Services Market Forecast**

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

INPUT forecasts that the information services market will grow at a compound annual growth rate (CAGR) of 8% per annum for the next five-year period (1995-2000), yielding a total market size of just over \$133 billion in the year 2000.

The European information services market, which totaled \$89 billion in 1995, accounts for 28% of the world IT services market, which, according to INPUT's last *Worldwide Forecast Compendium (1994-1999)*, is valued at \$323 billion. This puts it behind the United States market, valued at \$169 billion, which had a 52% share of the market. (NOTE: The 1995-2000 U.S. forecast has been published since the 1994-1999 *Worldwide Compendium* was released, and the 1995 U.S. information services market now stands at slightly over \$173 billion.) Europe is twice the size of Japan in terms of value—its market size is \$46 billion, with a market share of 14%.

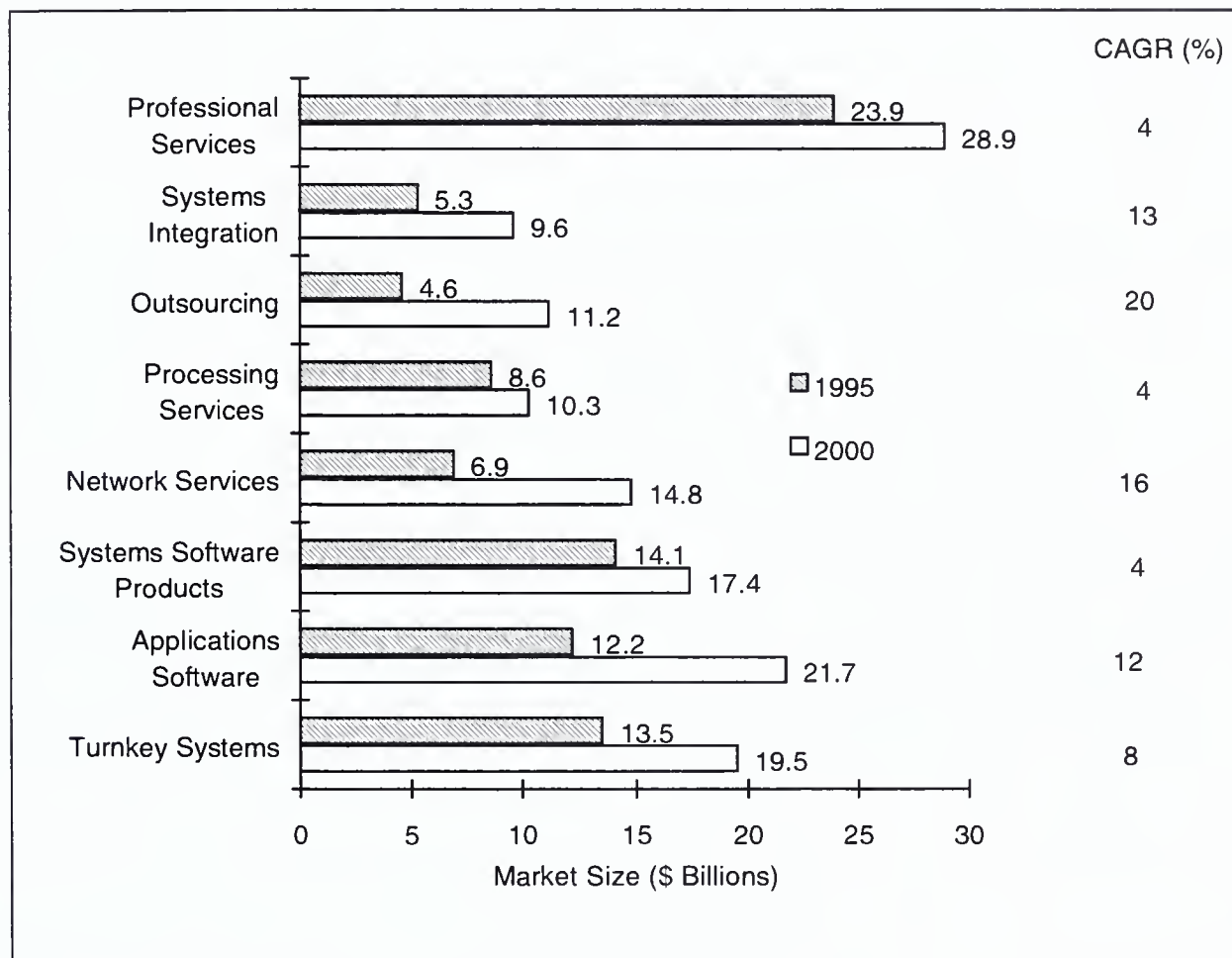
The four major economies—France, Germany, the U.K. and Italy—dominate the European market, accounting for 70% of all revenues. The next nine (medium-sized) countries account for 28%: these include Benelux (2 countries), the Nordic region (4 countries), Spain (included in INPUT's Mediterranean country grouping), and Switzerland and Austria (part of INPUT's Middle Europe country grouping).

The highest growth opportunity lies in the area of outsourcing. Extremely high growth rates for desktop services are causing this market segment to expand rapidly, although

admittedly from a relatively small base—in fact, the smallest of all product/service categories analyzed. The debate in Europe is whether outsourcing will continue to exhibit higher growth rates if it is used as a strategic tool rather than as a tactical instrument for cutting IT costs, as it has historically been utilized.

Exhibit 2

**Market Forecast by Product/Service Category  
Europe, 1995 - 2000**



Numbers are rounded

Source: INPUT

The internal communications network and the network outside of the enterprise will become one of the key competitive areas over the next five years. “Network-centricity” will become a major source of competitive advantage for utilizing information across multiple organizations, particularly those with international structures. Related to this development is the growth in Internet services and LAN/WAN *internetworking*.

Low-growth areas include systems software and professional services. Systems software is growing slowly because the number of enterprise systems continues to decline and competition is becoming much more intense as this segment of the market reaches

maturity. Growth in PC and workstation system software over the next five years (13%) is masked by mainframe volume declines (-6%).

Despite the growth of IS consulting and outsourcing of applications management (10% and 24%, respectively), professional services growth is tempered by low demand for custom software development (1%) due to the increased reliance on “packaged” application products, such as SAP R/3, which is becoming ubiquitous in France, Germany, and the U.K.

The systems integration market will continue to grow as vendors adopt a business-based approach to projects, adding value rather than containing cost. International organizations increasingly are demanding international service capability, a trend which is playing to the strengths of American vendors such as EDS, Andersen Consulting, IBM, and CSC.

As packaged applications software usage increases, and custom software development skills decline rapidly, the key to growth will be to develop offerings around applications such as SAP R/3. The turnkey sector will also benefit from standardized hardware and software packages that reduce the level of project complexity.

Leading Software and Services Vendors

The following table (Exhibit 3) notes Europe’s leading software and services vendors. The table offers a ranking, the vendor’s name and country of origin, and INPUT’s estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

## Exhibit 3

**Leading Software and Services Vendors—Europe, 1994**

| <b>Ranking</b> | <b>Company Name</b>    | <b>Country of Origin</b> | <b>Market Share (%)</b> |
|----------------|------------------------|--------------------------|-------------------------|
| 1              | IBM                    | United States            | 9.5                     |
| 2              | CGS                    | France                   | 2.4                     |
| 3              | SNI                    | Germany                  | 2.3                     |
| 4=             | Digital Equipment Corp | United States            | 2.1                     |
| 4=             | Reuters                | United Kingdom           | 2.1                     |
| 6              | EDS                    | United States            | 1.9                     |
| 7              | Microsoft              | United States            | 1.5                     |
| 8              | ICL                    | U.K./ Japan              | 1.4                     |
| 9=             | Bull                   | France                   | 1.3                     |
| 9=             | Andersen Consulting    | United States            | 1.3                     |

*Source: INPUT*

## IT Spending

The following table (Exhibit 4) offers INPUT's estimate of IT spending in Europe. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy costs), and information services spending.

Both dollar amounts (in U.S.\$ billions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

Equipment services is experiencing “commoditization” of the maintenance market, which fell by 4% during the last year. Maintenance contract costs are expected to continue declining as organizations either negotiate fewer contracts or force down the cost of existing contracts. Also, there is little opportunity for PC maintenance sales due to rapid technological advances in PC performance.



Exhibit 4

1995 IT Spending—Europe

| Budget Category      | Estimated Spending (\$ billions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 21.5                             | 8                      |
| Internal Staff       | 78.3                             | 28                     |
| Equipment            | 41.9                             | 15                     |
| Equipment Services   | 21.0                             | 8                      |
| Facilities           | 24.5                             | 9                      |
| Information Services | 89.1                             | 32                     |
| Total IT Spending    | 276.3                            | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for Europe, for the period 1995-2000.

## Exhibit 5

### Information Services Market Europe, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>REGIONAL TOTAL</b>           | 83460      | 7%               | 89100      | 97610      | 105270     | 113080     | 123280     | 133350     | 8%             |
| <b>Professional Services</b>    | 23290      | 3%               | 23930      | 24660      | 25610      | 26510      | 27630      | 28860      | 4%             |
| - IS Consulting                 | 3590       | 10%              | 3940       | 4290       | 4700       | 5160       | 5700       | 6270       | 10%            |
| - Education & Training          | 2650       | 6%               | 2820       | 3010       | 3210       | 3420       | 3650       | 3870       | 7%             |
| - Software Development          | 16760      | 0%               | 16780      | 16930      | 17330      | 17440      | 17700      | 17810      | 1%             |
| - Application Management        | 230        | 26%              | 290        | 360        | 460        | 570        | 710        | 850        | 24%            |
| <b>Systems Integration</b>      | 4710       | 12%              | 5260       | 5900       | 6710       | 7550       | 8490       | 9600       | 13%            |
| - Equipment                     | 1190       | 6%               | 1260       | 1260       | 1300       | 1370       | 1420       | 1560       | 4%             |
| - Applications Software         | 830        | 19%              | 990        | 1190       | 1490       | 1800       | 2220       | 2640       | 22%            |
| - Systems Software              | 350        | 11%              | 390        | 430        | 480        | 530        | 590        | 670        | 11%            |
| - Professional Services         | 2150       | 12%              | 2400       | 2780       | 3140       | 3480       | 3860       | 4260       | 12%            |
| - Other                         | 200        | 10%              | 220        | 260        | 290        | 370        | 380        | 460        | 16%            |
| <b>Outsourcing</b>              | 3620       | 26%              | 4570       | 5670       | 6880       | 8200       | 9640       | 11180      | 20%            |
| - Platform Operations           | 1030       | 14%              | 1170       | 1350       | 1490       | 1690       | 1860       | 2010       | 11%            |
| - Applications Operations       | 2080       | 31%              | 2730       | 3450       | 4250       | 5100       | 6040       | 6990       | 21%            |
| - Desktop Services              | 490        | 33%              | 650        | 860        | 1110       | 1410       | 1750       | 2160       | 27%            |
| <b>Processing Services</b>      | 8290       | 3%               | 8560       | 8800       | 9130       | 9510       | 9840       | 10300      | 4%             |
| - Transaction Processing        | 7090       | 2%               | 7240       | 7390       | 7600       | 7840       | 8060       | 8320       | 3%             |
| - Utility Processing            | 270        | 0%               | 270        | 270        | 270        | 270        | 270        | 280        | 1%             |
| - Other Processing              | 950        | 8%               | 1030       | 1140       | 1260       | 1390       | 1540       | 1690       | 10%            |
| <b>Network Services</b>         | 6110       | 13%              | 6890       | 7930       | 9210       | 10710      | 12580      | 14780      | 16%            |
| - Electronic Information Svcs   | 3740       | 9%               | 4090       | 4520       | 4960       | 5380       | 5850       | 6270       | 9%             |
| - Network Applications          | 1800       | 21%              | 2180       | 2720       | 3460       | 4410       | 5630       | 7180       | 27%            |
| - Network Management            | 560        | 11%              | 620        | 700        | 800        | 920        | 1080       | 1310       | 16%            |
| <b>Applications SW Products</b> | 11100      | 10%              | 12230      | 15010      | 16680      | 17830      | 20130      | 21730      | 12%            |
| - Mainframe                     | 860        | -7%              | 800        | 770        | 720        | 690        | 670        | 630        | -5%            |
| - Minicomputer                  | 3080       | 6%               | 3250       | 3460       | 3750       | 4110       | 4450       | 4830       | 8%             |
| - Workstation/PC                | 7120       | 15%              | 8190       | 10870      | 12300      | 12990      | 14930      | 16180      | 15%            |
| <b>Systems SW Products</b>      | 13450      | 5%               | 14130      | 15340      | 15700      | 16170      | 16960      | 17440      | 4%             |
| - Mainframe                     | 5550       | -4%              | 5310       | 5090       | 4820       | 4500       | 4210       | 3840       | -6%            |
| - Minicomputer                  | 4270       | 5%               | 4480       | 4720       | 4940       | 5210       | 5470       | 5750       | 5%             |
| - Workstation/PC                | 3590       | 21%              | 4330       | 5470       | 5920       | 6420       | 7250       | 7890       | 13%            |
| <b>Turnkey Systems</b>          | 12890      | 5%               | 13530      | 14300      | 15350      | 16600      | 18010      | 19460      | 8%             |
| - Equipment                     | 6260       | 2%               | 6410       | 6620       | 6870       | 7160       | 7480       | 7760       | 4%             |
| - Applications Software         | 2580       | 10%              | 2840       | 3050       | 3420       | 3840       | 4350       | 4870       | 11%            |
| - Systems Software              | 730        | 3%               | 750        | 800        | 840        | 900        | 950        | 1000       | 6%             |
| - Professional Services         | 3310       | 8%               | 3560       | 3850       | 4230       | 4690       | 5240       | 5790       | 10%            |

Numbers are rounded.

Source: INPUT





# Worldwide

## Information Services Program

COUNTRY PROFILES

EUROPE

## Middle Europe

Austria, Belgium, the Netherlands and Switzerland

September 1996

### Geographic Area Definition

For the purposes of INPUT's Worldwide Information Services Program, Austria, Belgium (including Luxembourg), the Netherlands, and Switzerland are considered together in this consolidated "Middle Europe" profile.

### Area Economic Overview

After suffering a damaging recession in 1993, the Belgian economy has staged an equally strong recovery. Belgium's GDP grew 2.3% in 1994 after a 1.7% drop the previous year, and 3.0% in 1995. The recovery is being led by sharp increases in exports and business investment, though consumer spending is still lackluster. Similar growth rates—around the 3% mark—are being experienced in Austria, the Netherlands, and Switzerland.

Key economic indicators are summarized in Exhibit 1. Inflation is the average projected for the period 1995-2000.

Exhibit 1

#### Key Economic Indicators

| Country     | GDP Growth Rate |      | Inflation Rate | Unemployment Rate | Exchange Rate |
|-------------|-----------------|------|----------------|-------------------|---------------|
|             | 1995            | 1996 |                |                   |               |
| Belgium     | 3.0%            | 3.1% | 2.4%           | 14.1%             | 31.8          |
| Netherlands | 2.9%            | 3.2% | 2.3%           | 8.8%              | 1.74          |
| Austria     | 3.0%            | 3.1% | 3.1%           | 4.3%              | 10.9          |
| Switzerland | 2.2%            | 2.7% | 2.1%           | 4.7%              | 1.31          |

Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995



Despite the improving economy, however, Belgium’s labor market problems still seem intractable. Unemployment was forecast to be 14.1% for 1995, well above the OECD average of 7.9%. Austria and Switzerland, by contrast, are experiencing much lower unemployment levels.

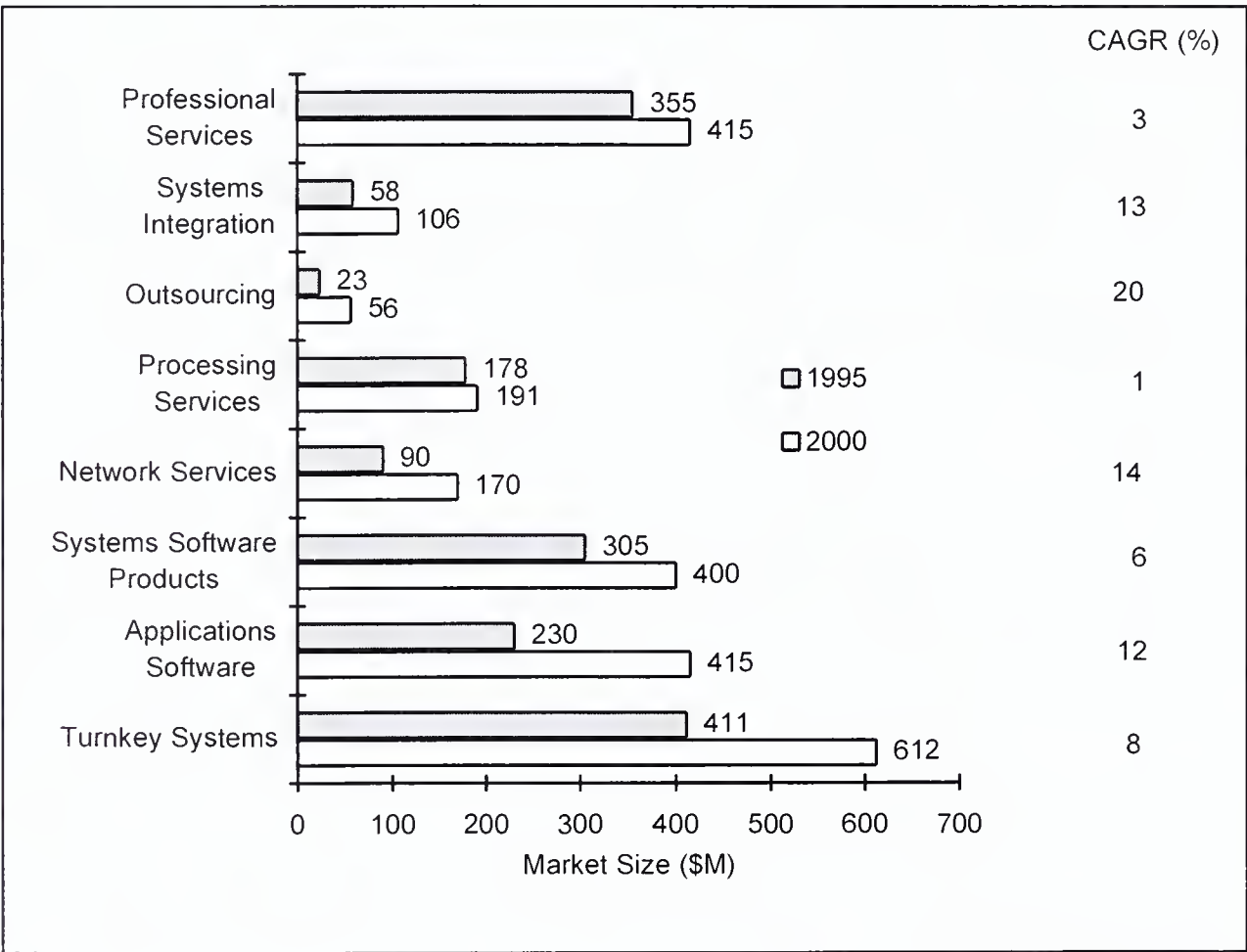
Information Services Market Forecast

These four Middle European countries accounted for 14.6% of the total European software and services market in 1994. This will remain essentially unchanged over the next five years (e.g., 14.7% by 2000).

Exhibits 2 to 5 summarize INPUT’s market forecast for each country across the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$.. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2

Market Forecast by Product/Service Category  
Austria, 1995 - 2000

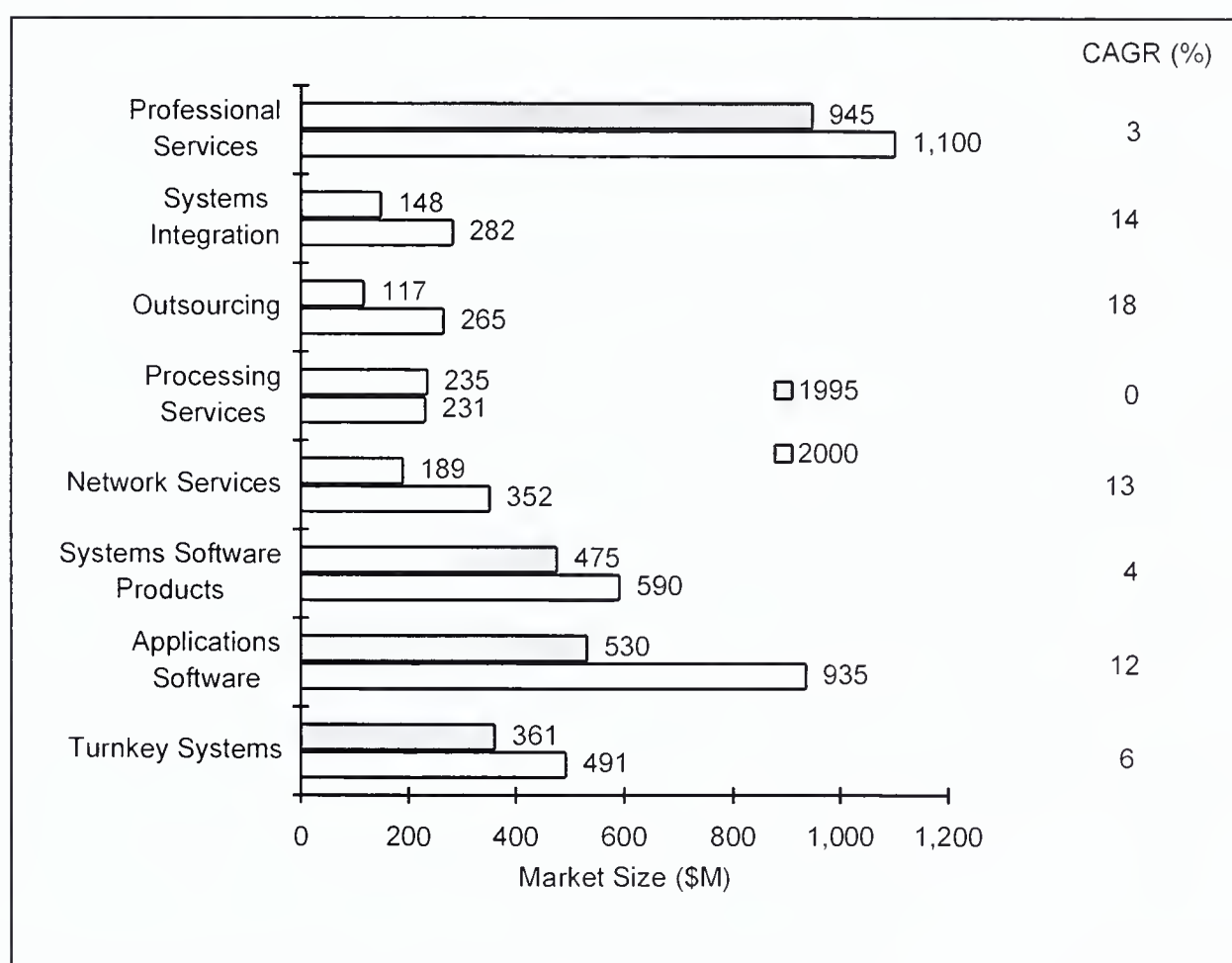


Source: INPUT

Austria has characteristics similar to the German market, with systems software professional services, and turnkey systems being the dominant delivery modes. Turnkey systems in Austria accounted for 25% of the software and services market in 1995, the highest proportion in Europe (and equivalent to Germany). In 1995 the Austrian market was worth \$1.7 billion and will grow at a 7% CAGR to \$2.3 billion by the end of the decade. The key growth areas are similar to those in Belgium and the Netherlands: outsourcing (a 20% CAGR), network services (14%) and systems integration (13%).

Exhibit 3

**Market Forecast by Product/Service Category  
Belgium, 1995 - 2000**

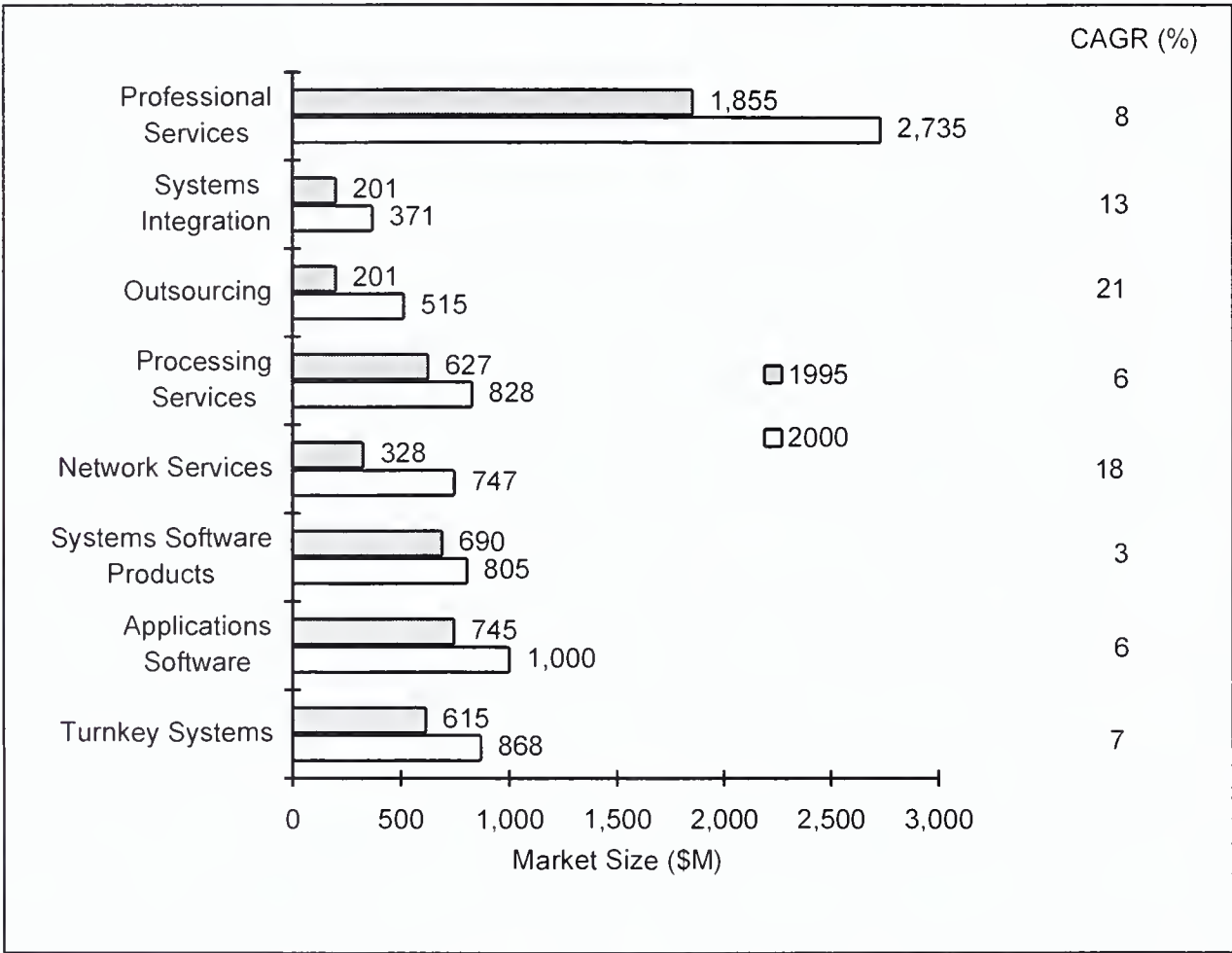


Source: INPUT

Belgium is characterized by a high proportion of business within the applications software market, accounting for 16% in 1994—the second highest after Italy—and rising to 22% by the year 2000. Its primary high growth opportunities lie in the areas of application solutions—especially network services—outsourcing, and systems integration. Custom software development continues to decline as a proportion of the software and services market. The Belgian market will grow at 7% per annum up to the year 2000 to reach \$4.2 billion.

Exhibit 4

Market Forecast by Product/Service Category  
Netherlands, 1995 - 2000



Source: INPUT

The Netherlands market for software and services is the fifth largest in Europe. INPUT forecasts that the market will grow by 8% annually over the next five years, from \$5.3 billion to \$7.9 billion.

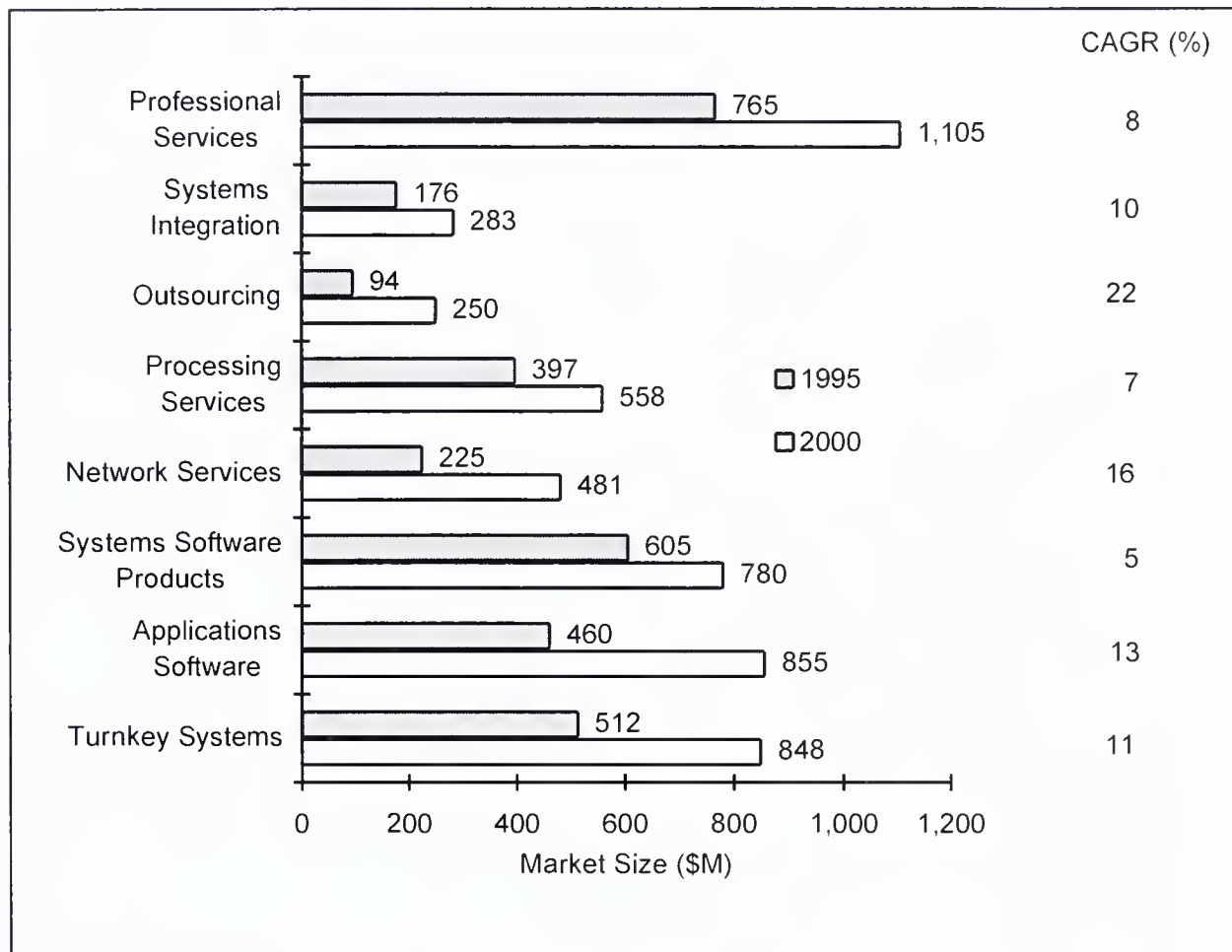
In 1995, professional services accounted for 35% of business within the Netherlands, compared to the European average of 27%.

By 1998, the Netherlands will have overtaken Italy to become the fourth largest professional services market within Europe and will grow to more than \$2.7 billion by the end of the decade. Its share of the total European professional services market will grow from 7.7% in 1995 to 9.5% by the year 2000.

The key areas of growth in the Netherlands market are outsourcing (21% over the next five years), network services (18%) and systems integration (13%).

Exhibit 5

### Market Forecast by Product/Service Category Switzerland, 1995 - 2000



Source: INPUT

The Swiss market for information services will grow at 10% per annum reaching \$5.2 billion by the end of the decade, from a 1995 base of \$3.2 billion. With the exception of systems integration, all of its delivery modes are growing at or above average European rates. The most significant growth will occur in outsourcing activities, reflecting the strong overall use of this resource in the European market.

## Leading Software and Services Vendors

The following tables (Exhibits 6 to 9) note the various countries' leading software and services vendors. Each table offers a ranking, the vendor's name and country of origin, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.



## Exhibit 6

**Leading Software and Services Vendors—Austria, 1994**

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 10.7             |
| 2       | SNI                     | Germany           | 5.4              |
| 3       | Management Data         | Austria           | 3.9              |
| 4       | Digital Equipment Corp. | United States     | 3.6              |
| 5       | Computer Associates     | United States     | 2.4              |
| 6       | SAP                     | Germany           | 2.3              |
| 7       | EDV                     | Austria           | 2.2              |
| 8       | Beko                    | Austria           | 1.7              |
| 9       | AI Informatic           | Austria           | 1.6              |
| 10      | GRZ Linz                | Austria           | 1.5              |

Source: INPUT

## Exhibit 7

**Leading Software and Services Vendors—Belgium, 1994**

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 7.5              |
| 2       | CSC                     | United States     | 7.1              |
| 3       | SNI                     | Germany           | 2.7              |
| 4       | Dolmen                  | Belgium           | 2.2              |
| 5       | Computer Associates     | United States     | 2.0              |
| 6       | Digital Equipment Corp. | United States     | 1.9              |
| 7       | CGS                     | France            | 1.8              |
| 8       | Unisys                  | United States     | 1.6              |
| 9=      | EDS                     | United States     | 1.4              |
| 9=      | Microsoft               | United States     | 1.4              |

Source: INPUT

Exhibit 8

**Leading Software and Services Vendors—Netherlands, 1994**

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | Cap Volmac              | France            | 8.5              |
| 2       | IBM                     | United States     | 8.0              |
| 3       | Getronics               | Netherlands       | 5.7              |
| 4       | Roccade                 | Netherlands       | 5.3              |
| 5       | BSO                     | Netherlands       | 4.8              |
| 6       | Raet                    | Netherlands       | 4.2              |
| 7       | CMG                     | United Kingdom    | 2.3              |
| 8       | Digital Equipment Corp. | United States     | 1.6              |
| 9       | Microsoft               | United States     | 1.3              |
| 10=     | CSC                     | United States     | 1.2              |
| 10=     | Ordina                  | Netherlands       | 1.2              |

Source: INPUT

Exhibit 9

**Leading Software and Services Vendors—Switzerland, 1994**

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 16.6             |
| 2       | Telekurs                | Switzerland       | 8.3              |
| 3       | Digital Equipment Corp. | United States     | 4.3              |
| 4       | Reuters                 | United Kingdom    | 3.8              |
| 5=      | Fides                   | Switzerland       | 2.8              |
| 5=      | SNI                     | Germany           | 2.8              |
| 7       | AT&T                    | United States     | 2.5              |
| 8=      | Computer Associates     | United States     | 2.3              |
| 8=      | Microsoft               | United States     | 2.3              |
| 10      | Unisys                  | United States     | 1.8              |

Source: INPUT

IT Spending

Exhibits 10 to 13 give INPUT’s estimate of IT spending in each of the four countries. Spending is segmented into six categories, showing both dollar amounts (in U.S.\$ billions) and IT spending (%) for each category.

The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and identified in the Forecast Database.

Exhibit 10

1995 IT Spending—Austria

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 290                                 | 6                      |
| Internal Staff       | 1,190                               | 23                     |
| Equipment            | 1,240                               | 24                     |
| Equipment Services   | 430                                 | 8                      |
| Facilities           | 300                                 | 6                      |
| Information Services | 1,650                               | 32                     |
| Total IT Spending    | 5,100                               | 100                    |

Numbers are rounded.

Source: INPUT

Exhibit 11

1995 IT Spending—Belgium

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 760                                 | 8                      |
| Internal Staff       | 2,650                               | 28                     |
| Equipment            | 1,700                               | 18                     |
| Equipment Services   | 620                                 | 7                      |
| Facilities           | 760                                 | 8                      |
| Information Services | 3,000                               | 32                     |
| Total IT Spending    | 9,490                               | 100                    |

Numbers are rounded.

Source: INPUT

Exhibit 12

**1995 IT Spending—Netherlands**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 980   | 7                             |
| Internal Staff           | 3,200                                       | 22                            |
| Equipment                | 2,400                                       | 17                            |
| Equipment Services       | 1,400                                       | 10                            |
| Facilities               | 1,100                                       | 8                             |
| Information Services     | 5,300                                       | 37                            |
| <b>Total IT Spending</b> | <b>14,380</b>                               | <b>100</b>                    |

Numbers are rounded.

Source: INPUT

Exhibit 13

**1995 IT Spending—Switzerland**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 990   | 8                             |
| Internal Staff           | 3,300                                       | 28                            |
| Equipment                | 2,400                                       | 20                            |
| Equipment Services       | 1,050                                       | 9                             |
| Facilities               | 760   | 7                             |
| Information Services     | 3,250                                       | 28                            |
| <b>Total IT Spending</b> | <b>11,750</b>                               | <b>100</b>                    |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibits 14 to 17) for the various countries for the period 1995-2000.



## Exhibit 14

### Information Services Market Austria, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 1515       | 9%               | 1650       | 1835       | 1970       | 2110       | 2250       | 2340       | 7%             |
| <b>Professional Services</b>    | 335        | 5%               | 355        | 365        | 385        | 395        | 405        | 415        | 3%             |
| - IS Consulting                 | 48         | 10%              | 53         | 58         | 64         | 68         | 73         | 77         | 8%             |
| - Education & Training          | 40         | 4%               | 41         | 43         | 45         | 46         | 47         | 49         | 3%             |
| - Software Development          | 250        | 2%               | 255        | 265        | 275        | 280        | 280        | 280        | 2%             |
| - Application Management        | 2          | 10%              | 2          | 2          | 3          | 3          | 4          | 5          | 21%            |
| <b>Systems Integration</b>      | 51         | 15%              | 58         | 64         | 73         | 82         | 93         | 106        | 13%            |
| - Equipment                     | 13         | 8%               | 14         | 15         | 16         | 17         | 18         | 18         | 5%             |
| - Applications Software         | 11         | 16%              | 13         | 14         | 17         | 19         | 23         | 30         | 18%            |
| - Systems Software              | 4          | 16%              | 5          | 6          | 6          | 6          | 7          | 7          | 10%            |
| - Professional Services         | 21         | 16%              | 25         | 28         | 32         | 35         | 42         | 47         | 14%            |
| - Other                         | 1          | 25%              | 1          | 2          | 2          | 5          | 3          | 4          | 25%            |
| <b>Outsourcing</b>              | 20         | 19%              | 23         | 28         | 34         | 41         | 48         | 56         | 20%            |
| - Platform Operations           | 4          | 16%              | 5          | 6          | 6          | 7          | 8          | 9          | 12%            |
| - Applications Operations       | 11         | 21%              | 14         | 16         | 21         | 24         | 28         | 31         | 19%            |
| - Desktop Services              | 4          | 22%              | 5          | 6          | 7          | 10         | 12         | 17         | 27%            |
| <b>Processing Services</b>      | 175        | 2%               | 178        | 179        | 183        | 186        | 190        | 191        | 1%             |
| - Transaction Processing        | 154        | 1%               | 155        | 156        | 159        | 162        | 164        | 164        | 1%             |
| - Utility Processing            | 6          | -3%              | 6          | 6          | 6          | 6          | 6          | 5          | -3%            |
| - Other Processing              | 16         | 6%               | 17         | 17         | 19         | 20         | 20         | 21         | 5%             |
| <b>Network Services</b>         | 81         | 11%              | 90         | 102        | 116        | 131        | 150        | 170        | 14%            |
| - Electronic Information Svcs   | 62         | 9%               | 68         | 75         | 83         | 91         | 100        | 109        | 10%            |
| - Network Applications          | 14         | 23%              | 18         | 22         | 28         | 34         | 42         | 52         | 24%            |
| - Network Management            | 4          | 11%              | 5          | 5          | 6          | 7          | 8          | 9          | 14%            |
| <b>Applications SW Products</b> | 200        | 14%              | 230        | 290        | 325        | 350        | 395        | 415        | 12%            |
| - Mainframe                     | 15         | 0%               | 15         | 15         | 15         | 15         | 15         | 14         | -1%            |
| - Minicomputer                  | 59         | 9%               | 64         | 71         | 78         | 86         | 94         | 98         | 9%             |
| - Workstation/PC                | 130        | 17%              | 150        | 205        | 230        | 250        | 285        | 300        | 15%            |
| <b>Systems SW Products</b>      | 280        | 8%               | 305        | 335        | 355        | 370        | 395        | 400        | 6%             |
| - Mainframe                     | 114        | -1%              | 113        | 111        | 110        | 109        | 108        | 101        | -2%            |
| - Minicomputer                  | 95         | 9%               | 103        | 112        | 122        | 133        | 144        | 150        | 8%             |
| - Workstation/PC                | 74         | 19%              | 88         | 111        | 120        | 130        | 145        | 150        | 11%            |
| <b>Turnkey Systems</b>          | 375        | 10%              | 411        | 452        | 492        | 535        | 586        | 612        | 8%             |
| - Equipment                     | 179        | 8%               | 193        | 208        | 221        | 236        | 253        | 258        | 6%             |
| - Applications Software         | 79         | 16%              | 91         | 105        | 121        | 139        | 159        | 175        | 14%            |
| - Systems Software              | 22         | 8%               | 24         | 26         | 28         | 29         | 31         | 32         | 6%             |
| - Professional Services         | 96         | 9%               | 104        | 113        | 122        | 131        | 142        | 147        | 7%             |

Numbers are rounded.

Source: INPUT

## Exhibit 15

### Information Services Market Belgium, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 2800       | 7%               | 2985       | 3270       | 3520       | 3740       | 4025       | 4245       | 7%             |
| <b>Professional Services</b>    | 925        | 2%               | 945        | 975        | 1000       | 1035       | 1070       | 1100       | 3%             |
| - IS Consulting                 | 157        | 9%               | 171        | 189        | 207        | 228        | 252        | 274        | 10%            |
| - Education & Training          | 76         | 2%               | 78         | 80         | 83         | 85         | 88         | 92         | 3%             |
| - Software Development          | 690        | 0%               | 690        | 700        | 705        | 715        | 725        | 725        | 1%             |
| - Application Management        | 3          | 15%              | 4          | 4          | 6          | 7          | 9          | 12         | 26%            |
| <b>Systems Integration</b>      | 132        | 12%              | 148        | 164        | 186        | 209        | 244        | 282        | 14%            |
| - Equipment                     | 31         | 12%              | 34         | 38         | 41         | 44         | 46         | 48         | 7%             |
| - Applications Software         | 29         | 12%              | 33         | 36         | 43         | 48         | 61         | 79         | 19%            |
| - Systems Software              | 11         | 26%              | 13         | 14         | 15         | 15         | 19         | 20         | 8%             |
| - Professional Services         | 54         | 15%              | 62         | 71         | 82         | 90         | 110        | 124        | 15%            |
| - Other                         | 8          | -25%             | 6          | 6          | 6          | 13         | 7          | 11         | 14%            |
| <b>Outsourcing</b>              | 101        | 16%              | 117        | 135        | 159        | 188        | 222        | 265        | 18%            |
| - Platform Operations           | 32         | 15%              | 36         | 41         | 47         | 52         | 58         | 65         | 12%            |
| - Applications Operations       | 63         | 15%              | 73         | 84         | 98         | 118        | 142        | 173        | 19%            |
| - Desktop Services              | 6          | 37%              | 8          | 11         | 14         | 18         | 22         | 28         | 28%            |
| <b>Processing Services</b>      | 241        | -2%              | 235        | 233        | 235        | 234        | 236        | 231        | 0%             |
| - Transaction Processing        | 213        | -3%              | 206        | 203        | 203        | 202        | 202        | 195        | -1%            |
| - Utility Processing            | 7          | -3%              | 6          | 6          | 6          | 6          | 6          | 6          | -2%            |
| - Other Processing              | 22         | 4%               | 23         | 24         | 26         | 27         | 29         | 30         | 6%             |
| <b>Network Services</b>         | 170        | 11%              | 189        | 214        | 246        | 277        | 318        | 352        | 13%            |
| - Electronic Information Svcs   | 101        | 8%               | 109        | 120        | 131        | 142        | 156        | 164        | 9%             |
| - Network Applications          | 63         | 18%              | 74         | 90         | 107        | 128        | 153        | 176        | 19%            |
| - Network Management            | 5          | 10%              | 5          | 6          | 7          | 8          | 9          | 12         | 17%            |
| <b>Applications SW Products</b> | 460        | 14%              | 530        | 665        | 750        | 800        | 875        | 935        | 12%            |
| - Mainframe                     | 33         | 0%               | 33         | 33         | 33         | 33         | 33         | 32         | -1%            |
| - Minicomputer                  | 134        | 11%              | 148        | 164        | 181        | 200        | 220        | 238        | 10%            |
| - Workstation/PC                | 295        | 18%              | 350        | 465        | 535        | 570        | 625        | 665        | 14%            |
| <b>Systems SW Products</b>      | 450        | 6%               | 475        | 515        | 530        | 550        | 580        | 590        | 4%             |
| - Mainframe                     | 202        | -1%              | 200        | 198        | 197        | 195        | 195        | 189        | -1%            |
| - Minicomputer                  | 148        | 6%               | 157        | 167        | 178        | 189        | 202        | 209        | 6%             |
| - Workstation/PC                | 99         | 19%              | 118        | 146        | 156        | 167        | 184        | 192        | 10%            |
| <b>Turnkey Systems</b>          | 335        | 8%               | 361        | 385        | 410        | 437        | 469        | 491        | 6%             |
| - Equipment                     | 157        | 4%               | 164        | 167        | 170        | 173        | 179        | 179        | 2%             |
| - Applications Software         | 74         | 13%              | 84         | 93         | 104        | 117        | 129        | 140        | 11%            |
| - Systems Software              | 15         | 5%               | 16         | 17         | 17         | 18         | 19         | 19         | 4%             |
| - Professional Services         | 89         | 10%              | 98         | 108        | 118        | 129        | 142        | 152        | 9%             |

Numbers are rounded.

Source: INPUT

## Exhibit 16

### Information Services Market Netherlands, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 4945       | 7%               | 5285       | 5745       | 6150       | 6610       | 7185       | 7875       | 8%             |
| <b>Professional Services</b>    | 1760       | 6%               | 1855       | 1970       | 2090       | 2225       | 2425       | 2735       | 8%             |
| - IS Consulting                 | 242        | 10%              | 265        | 290        | 319        | 351        | 394        | 460        | 12%            |
| - Education & Training          | 207        | 7%               | 222        | 237        | 254        | 274        | 296        | 323        | 8%             |
| - Software Development          | 1280       | 4%               | 1340       | 1400       | 1465       | 1535       | 1655       | 1850       | 7%             |
| - Application Management        | 26         | 22%              | 32         | 40         | 52         | 66         | 83         | 103        | 27%            |
| <b>Systems Integration</b>      | 178        | 13%              | 201        | 233        | 265        | 299        | 334        | 371        | 13%            |
| - Equipment                     | 45         | 8%               | 49         | 49         | 51         | 54         | 54         | 59         | 4%             |
| - Applications Software         | 25         | 30%              | 32         | 44         | 53         | 69         | 83         | 97         | 25%            |
| - Systems Software              | 14         | 12%              | 16         | 18         | 21         | 21         | 24         | 26         | 10%            |
| - Professional Services         | 81         | 13%              | 91         | 108        | 125        | 141        | 160        | 174        | 14%            |
| - Other                         | 14         | 0%               | 14         | 14         | 16         | 15         | 13         | 15         | 1%             |
| <b>Outsourcing</b>              | 167        | 21%              | 201        | 242        | 290        | 354        | 426        | 515        | 21%            |
| - Platform Operations           | 46         | 19%              | 55         | 63         | 72         | 84         | 95         | 107        | 14%            |
| - Applications Operations       | 81         | 14%              | 92         | 107        | 127        | 150        | 181        | 222        | 19%            |
| - Desktop Services              | 40         | 36%              | 55         | 72         | 92         | 121        | 149        | 187        | 28%            |
| <b>Processing Services</b>      | 592        | 6%               | 627        | 661        | 696        | 742        | 782        | 828        | 6%             |
| - Transaction Processing        | 523        | 5%               | 552        | 581        | 609        | 650        | 684        | 724        | 6%             |
| - Utility Processing            | 16         | 0%               | 16         | 16         | 16         | 17         | 17         | 17         | 2%             |
| - Other Processing              | 54         | 9%               | 59         | 63         | 69         | 75         | 81         | 89         | 9%             |
| <b>Network Services</b>         | 288        | 14%              | 328        | 382        | 451        | 535        | 635        | 747        | 18%            |
| - Electronic Information Svcs   | 155        | 7%               | 167        | 184        | 204        | 227        | 250        | 273        | 10%            |
| - Network Applications          | 115        | 23%              | 141        | 178        | 224        | 282        | 354        | 437        | 25%            |
| - Network Management            | 17         | 10%              | 19         | 20         | 23         | 26         | 32         | 38         | 15%            |
| <b>Applications SW Products</b> | 700        | 7%               | 745        | 875        | 920        | 925        | 975        | 1000       | 6%             |
| - Mainframe                     | 55         | -5%              | 52         | 52         | 49         | 46         | 46         | 43         | -4%            |
| - Minicomputer                  | 213        | 8%               | 230        | 250        | 273        | 296        | 322        | 351        | 9%             |
| - Workstation/PC                | 430        | 8%               | 465        | 570        | 600        | 580        | 610        | 605        | 5%             |
| <b>Systems SW Products</b>      | 690        | 0%               | 690        | 745        | 745        | 805        | 805        | 805        | 3%             |
| - Mainframe                     | 313        | -6%              | 293        | 282        | 270        | 259        | 242        | 227        | -5%            |
| - Minicomputer                  | 199        | 1%               | 201        | 210        | 219        | 227        | 230        | 233        | 3%             |
| - Workstation/PC                | 176        | 16%              | 204        | 253        | 273        | 293        | 316        | 331        | 10%            |
| <b>Turnkey Systems</b>          | 592        | 4%               | 615        | 632        | 661        | 713        | 782        | 868        | 7%             |
| - Equipment                     | 270        | 0%               | 270        | 265        | 265        | 270        | 285        | 302        | 2%             |
| - Applications Software         | 138        | 10%              | 153        | 164        | 181        | 204        | 233        | 270        | 12%            |
| - Systems Software              | 37         | 0%               | 37         | 37         | 37         | 38         | 40         | 43         | 3%             |
| - Professional Services         | 150        | 6%               | 158        | 170        | 181        | 199        | 222        | 250        | 10%            |

Numbers are rounded

Source: INPUT

## Exhibit 17

### Information Services Market Switzerland, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 3015       | 8%               | 3245       | 3590       | 3895       | 4275       | 4735       | 5155       | 10%            |
| <b>Professional Services</b>    | 740        | 3%               | 765        | 800        | 855        | 925        | 1010       | 1105       | 8%             |
| - IS Consulting                 | 92         | 8%               | 99         | 111        | 126        | 145        | 168        | 195        | 14%            |
| - Education & Training          | 122        | 2%               | 125        | 128        | 134        | 141        | 148        | 156        | 5%             |
| - Software Development          | 525        | 2%               | 535        | 555        | 590        | 635        | 685        | 745        | 7%             |
| - Application Management        | 5          | 17%              | 5          | 5          | 6          | 8          | 10         | 11         | 16%            |
| <b>Systems Integration</b>      | 161        | 10%              | 176        | 191        | 218        | 241        | 264        | 283        | 10%            |
| - Equipment                     | 41         | 0%               | 41         | 43         | 41         | 41         | 43         | 45         | 2%             |
| - Applications Software         | 22         | 21%              | 27         | 33         | 41         | 56         | 63         | 73         | 22%            |
| - Systems Software              | 13         | 6%               | 14         | 14         | 15         | 17         | 18         | 20         | 8%             |
| - Professional Services         | 73         | 12%              | 81         | 90         | 105        | 114        | 128        | 133        | 10%            |
| - Other                         | 13         | 6%               | 14         | 14         | 15         | 15         | 13         | 11         | -4%            |
| <b>Outsourcing</b>              | 79         | 19%              | 94         | 115        | 141        | 173        | 210        | 250        | 22%            |
| - Platform Operations           | 18         | 17%              | 21         | 25         | 28         | 33         | 38         | 42         | 15%            |
| - Applications Operations       | 50         | 20%              | 60         | 73         | 90         | 111        | 134        | 161        | 22%            |
| - Desktop Services              | 11         | 20%              | 14         | 18         | 23         | 29         | 38         | 47         | 28%            |
| <b>Processing Services</b>      | 370        | 7%               | 397        | 420        | 451        | 481        | 519        | 558        | 7%             |
| - Transaction Processing        | 321        | 7%               | 344        | 363        | 390        | 416        | 447        | 481        | 7%             |
| - Utility Processing            | 13         | 0%               | 13         | 14         | 14         | 14         | 15         | 15         | 2%             |
| - Other Processing              | 37         | 8%               | 40         | 44         | 48         | 51         | 57         | 61         | 9%             |
| <b>Network Services</b>         | 203        | 11%              | 225        | 264        | 306        | 355        | 416        | 481        | 16%            |
| - Electronic Information Svcs   | 145        | 8%               | 157        | 176        | 199        | 222        | 248        | 271        | 12%            |
| - Network Applications          | 50         | 23%              | 61         | 77         | 96         | 122        | 153        | 191        | 26%            |
| - Network Management            | 9          | 9%               | 9          | 10         | 12         | 13         | 16         | 18         | 14%            |
| <b>Applications SW Products</b> | 405        | 13%              | 460        | 575        | 650        | 695        | 785        | 855        | 13%            |
| - Mainframe                     | 46         | -3%              | 45         | 44         | 42         | 41         | 40         | 38         | -3%            |
| - Minicomputer                  | 115        | 10%              | 126        | 138        | 153        | 168        | 183        | 203        | 10%            |
| - Workstation/PC                | 245        | 19%              | 290        | 395        | 450        | 485        | 560        | 615        | 16%            |
| <b>Systems SW Products</b>      | 580        | 4%               | 605        | 645        | 670        | 695        | 745        | 780        | 5%             |
| - Mainframe                     | 256        | -4%              | 245        | 233        | 225        | 218        | 214        | 206        | -3%            |
| - Minicomputer                  | 183        | 4%               | 191        | 199        | 210        | 222        | 237        | 252        | 6%             |
| - Workstation/PC                | 141        | 19%              | 168        | 214        | 233        | 256        | 294        | 325        | 14%            |
| <b>Turnkey Systems</b>          | 481        | 6%               | 512        | 565        | 619        | 695        | 771        | 848        | 11%            |
| - Equipment                     | 256        | 4%               | 267        | 287        | 306        | 332        | 363        | 390        | 8%             |
| - Applications Software         | 69         | 11%              | 77         | 88         | 99         | 115        | 134        | 153        | 15%            |
| - Systems Software              | 27         | 0%               | 27         | 31         | 34         | 38         | 42         | 46         | 11%            |
| - Professional Services         | 130        | 9%               | 141        | 161        | 180        | 206        | 233        | 260        | 13%            |

Numbers are rounded.

Source: INPUT







# Worldwide

## Information Services Program

COUNTRY GROUPING

EUROPE

## Central and Eastern Europe

September 1996

### Geographic Area Definition

For the purposes of INPUT's Worldwide Information Services Program, the geographic area of Central and Eastern Europe is considered to include Poland, Hungary, the Czech Republic and Slovakia, Bulgaria, Romania, Estonia, Latvia, Lithuania, the independent states emerging from the former Yugoslavia, Albania and the new Commonwealth of former states of the Soviet Union (Byelorussia, Ukraine, the Russian Federation, *et al*). Due to the difficulty of obtaining market or economic data for this area, with the exception of the specific economic indicators noted below, this profile considers this region as a single, consolidated information services market—Central and Eastern Europe.

### Economic Overview

Reliable economic indicators for this area are notoriously difficult to obtain. However, statistics are available for the Czech and Slovak republics, Hungary, Poland and the former Soviet Union, as summarized in Exhibits 1 to 5. The data provided was the latest available at the time this Central and Eastern Europe analysis was performed and the 1995-2000 information services forecast prepared.

#### Exhibit 1

##### Key Economic Indicators—Czech Republic

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1992                   | -6.7% |
| - 1993                   | -2.0% |
| Inflation Rate (1993)    | 19.0% |
| Unemployment Rate (1993) | 3.8%  |

Source: EIU

Exhibit 2

Key Economic Indicators—Slovakia

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1992                   | -6.0% |
| - 1993                   | -9.0% |
| Inflation Rate (1993)    | 36.0% |
| Unemployment Rate (1993) | 17.0% |

Source: EIU

Exhibit 3

Key Economic Indicators—Hungary

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1992                   | 0.0%  |
| - 1993                   | 1.5%  |
| Inflation Rate (1993)    | 23.0% |
| Unemployment Rate (1993) | 15.0% |

Source: EIU

Exhibit 4

Key Economic Indicators—Poland

| Indicator                | Value |
|--------------------------|-------|
| GDP Growth Rate          |       |
| - 1992                   | 1.0%  |
| - 1993                   | 3.0%  |
| Inflation Rate (1993)    | 37.0% |
| Unemployment Rate (1993) | 15.5% |

Source: EIU

## Exhibit 5

**Key Economic Indicators—Former Soviet Union**

| Indicator             | Value  |
|-----------------------|--------|
| GDP Growth Rate       |        |
| - 1992                | -19.0% |
| - 1993                | -10.0% |
| Inflation Rate (1993) | 2,000% |

*Source: EIU*

Although this consolidated market is forecast to grow at a 19% compound annual growth rate (CAGR) between 1995 and 2000, the overall economies of many of the countries, especially the Czech Republic, Slovakia, Hungary, and Poland, are expected to improve performance in all areas of economic measurement in 1994 and 1995. The expected reductions in inflation and unemployment rates, coupled with increases in the gross domestic product (GDP) growth rates—both overall and per capita—will drive the major Central and Eastern Europe economies and result in improved business performance in the last half of this decade. This will lead to the increased use of information services resources forecast below.

The former Soviet Union—for convenience referred to in this paragraph as Russia—is in a somewhat different state. Although GDP growth is expected to remain negative until 1997 or later, inflation should fall to a mere 10% a month (!) in the middle of this decade, with unemployment at about 7%. The unemployment figure is misleading, however, since though most Russians are employed, they are not fully employed, thus perpetuating a chronic condition of underemployment rather than unemployment. The solution to this condition is not expected before the millennium.

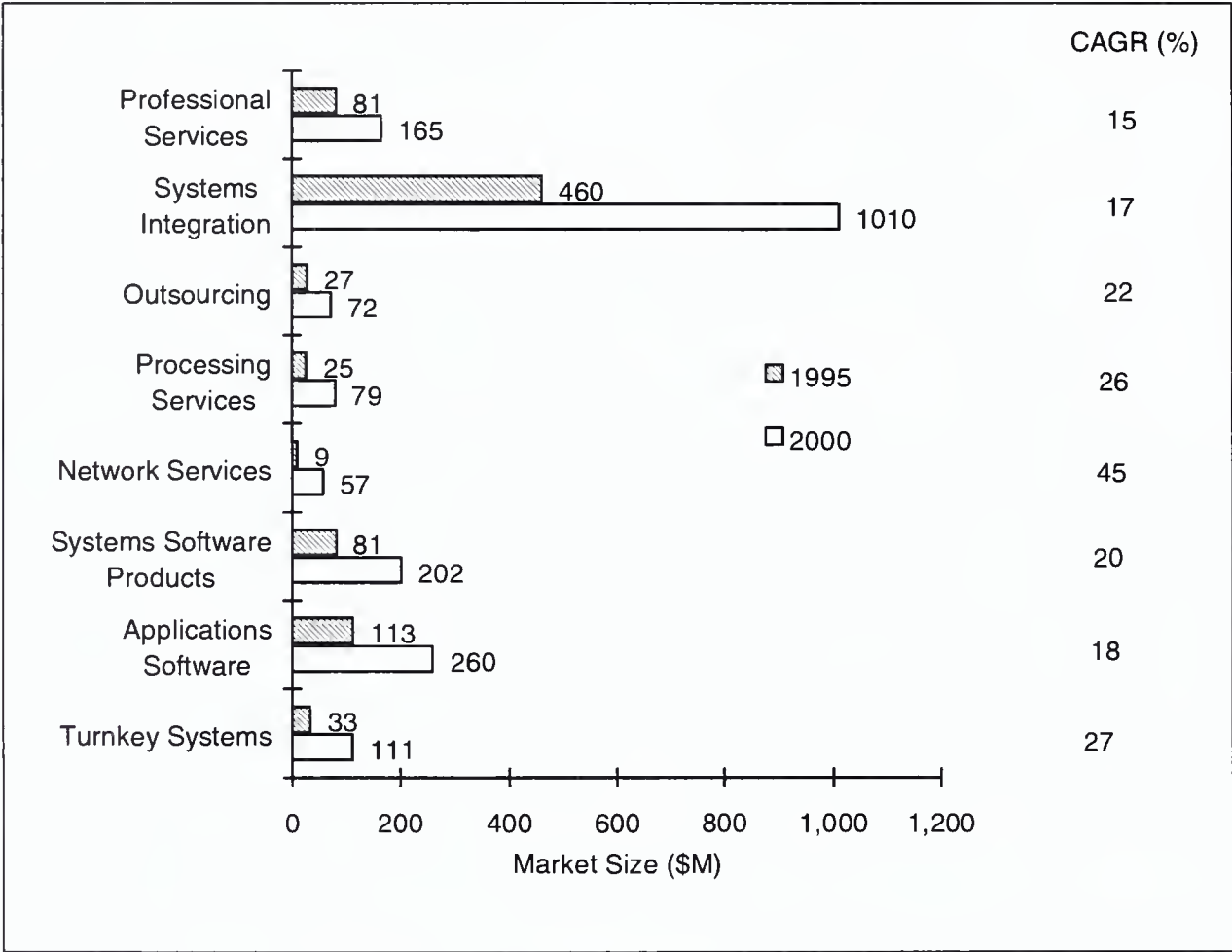
## Information Services Market Forecast

Exhibit 6 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.



Exhibit 6

Market Forecast by Product/Service Category  
Central and Eastern Europe, 1995 - 2000



Source: INPUT

This market was valued at almost \$720 million in 1994, but will increase to nearly \$2 billion by the end of the decade, with an annual average growth rate (1995-2000) of 19%.

One source of potential growth stems from the small size of the average IT hardware market in eastern Europe. An analysis of IT expenditure shows that hardware spending in the region is much lower than that of the average country market in western Europe, despite programs for expanding IT infrastructures. This does not necessarily imply a major growth market for hardware vendors desperately seeking new sources of revenue, however. At the start of this decade hardware vendors predicted that major service and support contracts would “ride on the back” of mainframe deals. However, roughly 50% of the mainframes in these economies have been taken out as operations were downsized or split up.

As much of the region's IT activity is limited to PCs and related technologies, most growth in this sector is from sales of packaged software (such as application tools for database development and management), networking, and software support services. Other sources of vendor activity include IT consulting for large-scale projects, particularly in the areas of banking and finance, government, and education and training.

Improvements in communications are being realized through the installation of cellular-based mobile networks, either in place of or in addition to fixed network projects. Network services will expand as a functional, reliable telecommunications infrastructure is established. Other recurring problems in this region include an immature legal system, poor security, political instability, and currency and exchange issues.

Some trends are emerging, however:

- Market segments are forming, providing opportunities for niche players. For example, Sun Microsystems opened a Moscow subsidiary to target applications not covered by its software partners. Advanced network management tools are perceived as a possible niche.
- Different market segments are emerging in different countries. The Russian market is experiencing significant growth in PC sales (IBM shipped 100,000 units in 1994), while the more mature central European markets—such as Poland, Hungary, and the Czech Republic—are finding mid-range systems more popular, particularly with client/server configurations.
- Although customers in this region used to prefer buying hardware and related systems tools and developing their own applications, now the emphasis is on buying a working application from a vendor, despite the potential complexity of understanding and implementing someone else's design.
- The region is the fourth largest in Europe for systems integration, valued in 1994 at \$410 million. It will grow at 17% per annum to become a one billion dollar market by the year 2000. Major hardware vendors, such as Digital, ICL, BULL and IBM, have been setting up new infrastructures over the last three to four years to support major industry sectors such as banking and central governments.
- Joint ventures are seen as technical alliances that are not legally binding (partly due to the lack of enforcement resulting from an immature legal system), rather than formal business arrangements. There is also an increasing trend to work with local, post-communist entrepreneurs. Oracle has

set up informal partnerships with a view to corporate integration in the medium-term future (usually 18 months). ICL has two joint ventures in Russia. One is with Moscow-based KMECS (one of the country's largest mainframe manufacturers) to produce mid-range systems and PCs. The other is with Marine Computer Systems, a St. Petersburg-based software developer. ICL plans to invest \$5 million in the former project, which is valued at \$8 million.

- Due to the lack of budget and planning disciplines, vendor investment strategies tend to be (understandably) conservative and focus on two criteria: (1) whether the country has an existing democratic political structure and (2) if the World Bank has made any commitment to the national economy.
- There is a strong intellectual base—which means the labor force is often as skilled as in the West (if not better), but not as expensive. Historically, Eastern European labor has excelled at working with statistical software and solving technical problems, as compared to creating applications and solutions to business problems. However, the situation is changing dramatically as a Western “corporate culture” begins to pervade the work force.

Overall, prospects are encouraging, given that IT demand for systems is increasing, and doing business is much easier than in the EC, where there are constraints such as value-added taxation.

**Leading Software and Services Vendors**

The following table (Exhibit 7) identifies Central and Eastern Europe’s leading software and services vendors. The table offers a ranking, the vendor’s name and country of origin, and INPUT’s estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

## Exhibit 7

**Leading Software and Services Vendors—Central and Eastern Europe, 1994**

| <b>Ranking</b> | <b>Company Name</b>    | <b>Country of Origin</b> | <b>Market Share (%)</b> |
|----------------|------------------------|--------------------------|-------------------------|
| 1              | IBM                    | United States            | 4.2                     |
| 2=             | ICL                    | U.K./Japan               | 2.8                     |
| 2=             | Microsoft              | United States            | 2.8                     |
| 4              | Unisys                 | United States            | 2.1                     |
| 5=             | SNI                    | Germany                  | 1.4                     |
| 5=             | Digital Equipment Corp | United States            | 1.4                     |
| 7=             | SAP                    | Germany                  | 0.7                     |
| 7=             | Andersen Consulting    | United States            | 0.7                     |
| 7=             | SSA                    | United States            | 0.7                     |
| 7=             | CGS                    | France                   | 0.7                     |

Source: INPUT

**IT Spending**

The following table (Exhibit 8) offers INPUT's estimate of IT spending in Central and Eastern Europe. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy costs), and information services spending.

Both dollar amounts (in U.S.\$ billions) and percent of total IT spending are shown for each category. The IT "equipment" category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the "equipment" subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.



Exhibit 8

1995 IT Spending—Central and Eastern Europe

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 130                              | 5                      |
| Internal Staff       | 710                              | 27                     |
| Equipment            | 530                              | 20                     |
| Equipment Services   | 270                              | 10                     |
| Facilities           | 150                              | 6                      |
| Information Services | 830                              | 32                     |
| Total IT Spending    | 2,620                            | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 9) for the Central and Eastern Europe, for the period 1995-2000.

## Exhibit 9

### Information Services Market Central and Eastern Europe, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>AREA TOTAL</b>               | 715        | 16%              | 830        | 990        | 1175       | 1385       | 1655       | 1955       | 19%            |
| <b>Professional Services</b>    | 71         | 14%              | 81         | 93         | 107        | 125        | 144        | 165        | 15%            |
| - IS Consulting                 | 2          | 0%               | 2          | 2          | 2          | 2          | 2          | 2          | 0%             |
| - Education & Training          | 41         | 15%              | 47         | 55         | 64         | 76         | 89         | 105        | 17%            |
| - Software Development          | 28         | 14%              | 32         | 36         | 41         | 47         | 53         | 58         | 13%            |
| - Application Management        | 0          | 0%               | 0          | 0          | 0          | 0          | 0          | 0          | 0%             |
| <b>Systems Integration</b>      | 410        | 12%              | 460        | 530        | 625        | 735        | 865        | 1010       | 17%            |
| - Equipment                     | 94         | 7%               | 101        | 111        | 119        | 125        | 147        | 172        | 11%            |
| - Applications Software         | 57         | 30%              | 74         | 90         | 125        | 162        | 207        | 262        | 29%            |
| - Systems Software              | 33         | -3%              | 32         | 37         | 44         | 52         | 52         | 71         | 17%            |
| - Professional Services         | 193        | 12%              | 216        | 249        | 294        | 346        | 405        | 444        | 16%            |
| - Other                         | 33         | 12%              | 37         | 42         | 44         | 52         | 52         | 61         | 11%            |
| <b>Outsourcing</b>              | 20         | 35%              | 27         | 32         | 42         | 50         | 60         | 72         | 22%            |
| - Platform Operations           | 9          | 33%              | 12         | 15         | 20         | 25         | 28         | 35         | 24%            |
| - Applications Operations       | 8          | 38%              | 11         | 12         | 15         | 15         | 20         | 22         | 15%            |
| - Desktop Services              | 3          | 33%              | 4          | 5          | 7          | 10         | 12         | 15         | 30%            |
| <b>Processing Services</b>      | 20         | 25%              | 25         | 29         | 36         | 45         | 59         | 79         | 26%            |
| - Transaction Processing        | 10         | 20%              | 12         | 13         | 15         | 17         | 20         | 24         | 15%            |
| - Utility Processing            | 6          | 17%              | 7          | 7          | 8          | 8          | 9          | 10         | 7%             |
| - Other Processing              | 4          | 50%              | 6          | 9          | 13         | 20         | 30         | 45         | 49%            |
| <b>Network Services</b>         | 8          | 13%              | 9          | 13         | 19         | 27         | 39         | 57         | 45%            |
| - Electronic Information Svcs   | 1          | 0%               | 1          | 1          | 2          | 2          | 3          | 3          | 43%            |
| - Network Applications          | 4          | 50%              | 6          | 9          | 14         | 21         | 31         | 47         | 51%            |
| - Network Management            | 3          | -7%              | 3          | 3          | 4          | 4          | 5          | 7          | 20%            |
| <b>Applications SW Products</b> | 94         | 20%              | 113        | 148        | 173        | 194        | 228        | 260        | 18%            |
| - Mainframe                     | 10         | 0%               | 10         | 11         | 11         | 11         | 11         | 11         | 2%             |
| - Minicomputer                  | 30         | 17%              | 35         | 41         | 47         | 54         | 62         | 71         | 15%            |
| - Workstation/PC                | 54         | 26%              | 68         | 96         | 115        | 129        | 155        | 178        | 21%            |
| <b>Systems SW Products</b>      | 67         | 21%              | 81         | 101        | 119        | 141        | 170        | 202        | 20%            |
| - Mainframe                     | 15         | 0%               | 15         | 16         | 16         | 16         | 16         | 16         | 1%             |
| - Minicomputer                  | 21         | 19%              | 25         | 29         | 35         | 42         | 50         | 60         | 19%            |
| - Workstation/PC                | 31         | 32%              | 41         | 57         | 69         | 84         | 104        | 126        | 25%            |
| <b>Turnkey Systems</b>          | 27         | 22%              | 33         | 43         | 54         | 69         | 88         | 111        | 27%            |
| - Equipment                     | 13         | 23%              | 16         | 20         | 25         | 31         | 39         | 48         | 25%            |
| - Applications Software         | 5          | 20%              | 6          | 8          | 10         | 13         | 17         | 22         | 30%            |
| - Systems Software              | 1          | 0%               | 1          | 2          | 2          | 3          | 3          | 4          | 32%            |
| - Professional Services         | 8          | 25%              | 10         | 13         | 17         | 22         | 29         | 37         | 30%            |

Source: INPUT





# Worldwide

## Information Services Program

COUNTRY PROFILE

EUROPE

## France

### Economic Overview

The key issue in France is reducing the government's large budget deficit. To this end, a proposed plan to reform the French social welfare system—a necessary step, many feel, to return the French economy to a competitive position in world markets—is meeting with strong opposition from French unions, but with the exception of a few negotiated changes, the plan remains essentially in place. The French economy shrank by 0.3 percent in the final quarter of 1995, due primarily to public employee strikes protesting the social welfare reforms. This reversal of the growth seen in earlier quarters makes it unlikely that France will achieve its goal of reducing its budget deficit to the targeted 3% of GDP in 1997. Labor unrest has also affected the general business environment, and GDP growth for 1996 is expected to be essentially flat. Key economic indicators for France are summarized in Exhibit 1.

Exhibit 1

#### Key Economic Indicators—France

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 3.1%  |
| - 1996                     | 3.2%  |
| Inflation Rate (1995-2000) | 1.9%  |
| Unemployment Rate          | 12.6% |
| Exchange Rate              | 5.34  |

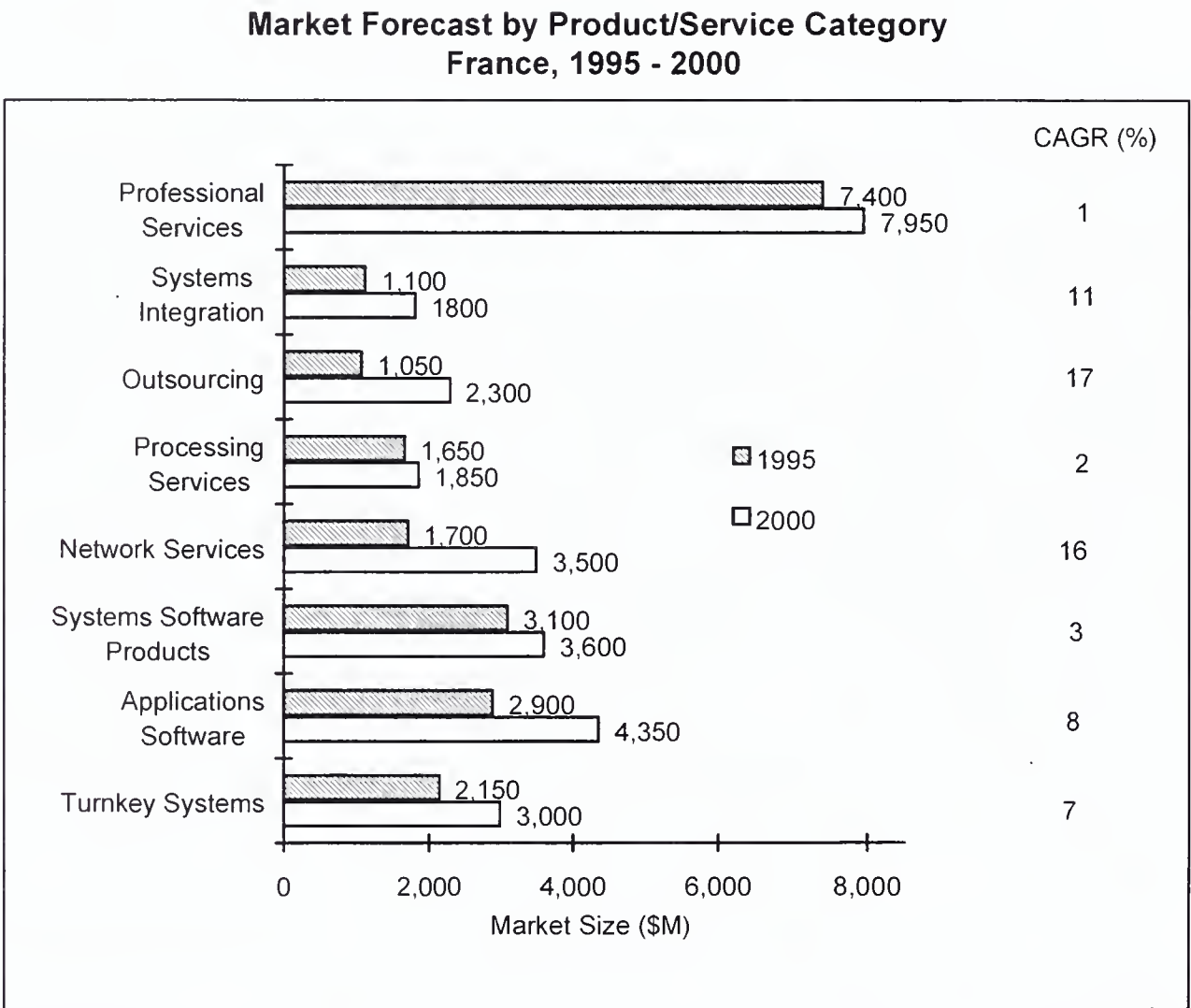
Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995



## Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2



Numbers are rounded

Source: INPUT

INPUT forecasts that the French market will grow over the next five years by 6% per annum; however, there is a relative lack of growth across the French information services market when compared to other European countries. There is great reliance on custom software development which, although it constitutes a large segment of professional services, is a declining element in the overall market due to intense price pressure. Professional services accounts for 35% of the French information services market in 1995;

this compares to a European average of 28% (only Sweden is higher at 42%). In addition, France is the only European country to maintain a strong national presence in its home market. This may raise problems in the future, given the trend toward businesses preferring to work with vendors that possess international, as opposed to national, capability.

In France, as in other countries, multinational corporations are becoming increasingly international in their outlook and operation. Their suppliers, therefore, are expected to support them regardless of the territories or time zones in which such companies choose to operate. This is particularly true in the markets for systems integration and outsourcing and, as noted above, could be a problem in France for national professional services vendors who lack strong international capability.

As with most other countries, telecommunications is playing an ever-increasing role in the French information services marketplace, and growth in the use of network services, at a 16% CAGR, reflects this trend. Spending for outsourcing will increase by almost \$1.3 billion, at a CAGR of 17%—the highest for all information services product/service categories—a result of ongoing operational cost concerns and strong efforts by vendors such as EDS (United States), Telesystems (France), and CGS (France).

With regard to specific industry markets, increased IT consultancy skills, to deal with more complex user requirements, are needed in the banking and finance, health, insurance, and government sectors. As a result of this approach, there is also increased demand for education and training. Traditionally, systems vendors controlled hardware and (to some extent) software—especially systems software. Training was therefore linked to the vendor. Now, independent service vendors and IT consultants are entering this area, particularly within the manufacturing, health, and government sectors. The drive to open systems means that there is now no reason to be linked to a specific vendor.

In 1995 France represented just under 24% of the European market. This share will decline to 21% by the year 2000.

## Leading Software and Services Vendors

The following table (Exhibit 3) notes France's leading software and services vendors. The table offers a ranking, the vendor's name and country of origin, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

Exhibit 3

Leading Software and Services Vendors—France, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 7.2              |
| 2       | CGS                     | France            | 2.9              |
| 3       | Bull                    | France            | 2.6              |
| 4       | EDS                     | United States     | 1.9              |
| 5       | Digital Equipment Corp. | United States     | 1.8              |
| 6       | Sligos                  | France            | 1.8              |
| 7       | Reuters                 | United Kingdom    | 1.7              |
| 8       | Axime                   | France            | 1.5              |
| 9       | GSI                     | France            | 1.5              |
| 10      | Microsoft               | United States     | 1.3              |

Source: INPUT

IT Spending

The following table (Exhibit 4) offers INPUT’s estimate of IT spending in France. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

## Exhibit 4

**1995 IT Spending—France**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 3,950                                       | 7                             |
| Internal Staff           | 16,350                                      | 28                            |
| Equipment                | 7,300                                       | 13                            |
| Equipment Services       | 3,650                                       | 6                             |
| Facilities               | 5,950                                       | 10                            |
| Information Services     | 20,950                                      | 36                            |
| <b>Total IT Spending</b> | <b>58,150</b>                               | <b>100</b>                    |

*Numbers are rounded.*

*Source: INPUT*

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for France, for the period 1995-2000.



Exhibit 5

## Information Services Market France, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 20225      | 4%               | 20975      | 22470      | 23595      | 24720      | 26590      | 28275      | 6%             |
| <b>Professional Services</b>    | 7265       | 2%               | 7380       | 7510       | 7640       | 7715       | 7830       | 7940       | 1%             |
| - IS Consulting                 | 899        | 10%              | 993        | 1040       | 1105       | 1171       | 1255       | 1339       | 6%             |
| - Education & Training          | 676        | 6%               | 717        | 767        | 821        | 870        | 922        | 977        | 6%             |
| - Software Development          | 5635       | -1%              | 5600       | 5610       | 5600       | 5535       | 5480       | 5420       | -1%            |
| - Application Management        | 49         | 35%              | 66         | 86         | 112        | 139        | 174        | 206        | 26%            |
| <b>Systems Integration</b>      | 1011       | 8%               | 1096       | 1217       | 1339       | 1480       | 1629       | 1807       | 11%            |
| - Equipment                     | 253        | 8%               | 274        | 279        | 280        | 282        | 296        | 308        | 2%             |
| - Applications Software         | 182        | 14%              | 208        | 255        | 307        | 370        | 444        | 506        | 20%            |
| - Systems Software              | 81         | 8%               | 87         | 85         | 93         | 104        | 115        | 127        | 8%             |
| - Professional Services         | 476        | 6%               | 503        | 558        | 614        | 682        | 723        | 796        | 10%            |
| - Other                         | 20         | 8%               | 22         | 36         | 40         | 44         | 49         | 72         | 27%            |
| <b>Outsourcing</b>              | 880        | 18%              | 1038       | 1255       | 1489       | 1723       | 1985       | 2294       | 17%            |
| - Platform Operations           | 296        | 12%              | 332        | 375        | 412        | 459        | 506        | 543        | 10%            |
| - Applications Operations       | 487        | 18%              | 575        | 702        | 843        | 965        | 1105       | 1283       | 17%            |
| - Desktop Services              | 97         | 35%              | 131        | 178        | 234        | 300        | 375        | 468        | 29%            |
| <b>Processing Services</b>      | 1667       | 0%               | 1667       | 1658       | 1676       | 1714       | 1789       | 1873       | 2%             |
| - Transaction Processing        | 1433       | -1%              | 1423       | 1395       | 1395       | 1414       | 1470       | 1526       | 1%             |
| - Utility Processing            | 67         | 0%               | 67         | 65         | 64         | 64         | 65         | 66         | 0%             |
| - Other Processing              | 164        | 10%              | 181        | 199        | 217        | 237        | 257        | 276        | 9%             |
| <b>Network Services</b>         | 1564       | 9%               | 1704       | 1908       | 2156       | 2483       | 2946       | 3517       | 16%            |
| - Electronic Information Svcs   | 880        | 9%               | 955        | 1030       | 1105       | 1189       | 1311       | 1433       | 8%             |
| - Network Applications          | 526        | 7%               | 565        | 662        | 799        | 997        | 1284       | 1667       | 24%            |
| - Network Management            | 158        | 17%              | 185        | 216        | 252        | 297        | 351        | 418        | 18%            |
| <b>Applications SW Products</b> | 2790       | 5%               | 2920       | 3390       | 3615       | 3725       | 4100       | 4325       | 8%             |
| - Mainframe                     | 161        | -14%             | 139        | 120        | 106        | 95         | 87         | 81         | -10%           |
| - Minicomputer                  | 813        | 1%               | 820        | 834        | 879        | 949        | 1005       | 1031       | 5%             |
| - Workstation/PC                | 1815       | 8%               | 1960       | 2435       | 2625       | 2690       | 3015       | 3220       | 10%            |
| <b>Systems SW Products</b>      | 2960       | 4%               | 3090       | 3275       | 3295       | 3350       | 3500       | 3615       | 3%             |
| - Mainframe                     | 1180       | -4%              | 1133       | 1086       | 1021       | 946        | 880        | 796        | -7%            |
| - Minicomputer                  | 993        | 4%               | 1030       | 1049       | 1077       | 1124       | 1189       | 1264       | 4%             |
| - Workstation/PC                | 787        | 18%              | 924        | 1144       | 1203       | 1279       | 1438       | 1555       | 11%            |
| <b>Turnkey Systems</b>          | 2060       | 4%               | 2135       | 2229       | 2341       | 2528       | 2734       | 2959       | 7%             |
| - Equipment                     | 1011       | 2%               | 1030       | 1049       | 1077       | 1114       | 1161       | 1208       | 3%             |
| - Applications Software         | 487        | 6%               | 515        | 553        | 590        | 665        | 740        | 824        | 10%            |
| - Systems Software              | 36         | 5%               | 37         | 40         | 43         | 45         | 48         | 51         | 6%             |
| - Professional Services         | 525        | 6%               | 555        | 594        | 633        | 702        | 791        | 880        | 10%            |



# Worldwide

## Information Services Program

COUNTRY PROFILE

EUROPE

## Germany

### Economic Overview

The German economy is moving out of a recessionary environment, spurred on by demand in eastern Europe and strong growth within the services sector generally. It is estimated by the Institut der Deutschen Wirtschaft (IWD) that in 1994 employees in all service industries, except retailing, generated more added value per head than manufacturing's overall DM 90,000 a year. The IWD also discovered that two-thirds of all new jobs created in the 1980s emerged in the services category. Eastern Germany, however, is still missing the higher value-added service businesses, such as software houses. One forecast for the next 15 years predicts the creation of 2.5 million new German services jobs. Exhibit 1, Key Economic Indicators, shows 1995 GDP growth unchanged from 1994, but increasing by 25% in 1996 as the economy continues to strengthen. Inflation for the period 1995-2000 will average 2.4%, slightly below the European average of 2.6% for the same period, and unemployment (western Germany only) is a low 8.2%.

Exhibit 1

**Key Economic Indicators—Germany**

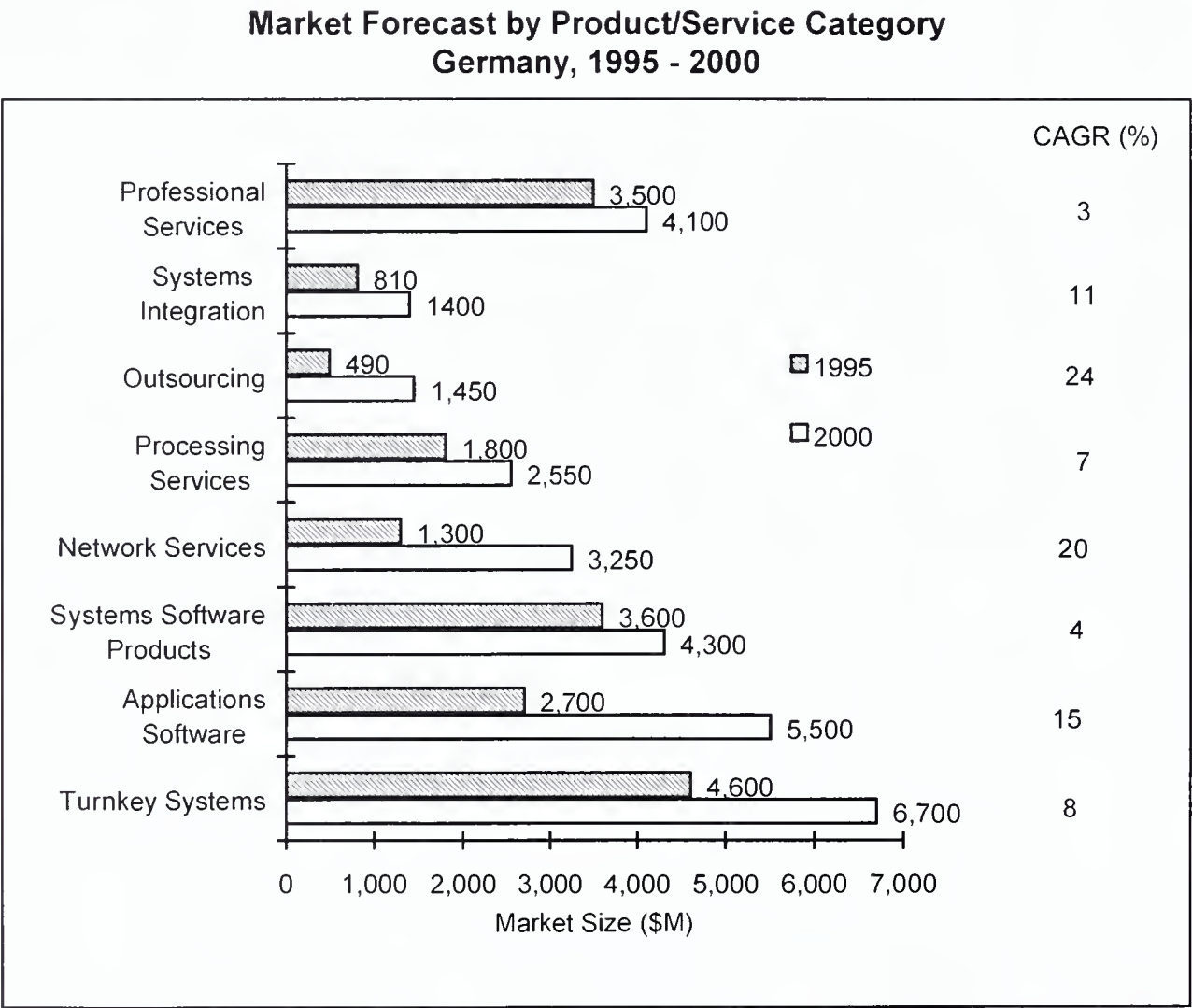
| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 2.8%  |
| - 1996                     | 3.5%  |
| Inflation Rate (1995-2000) | 2.4%  |
| Unemployment Rate          | 8.2%  |
| Exchange Rate              | 1.55  |

Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995

## Information Services Market Forecast

Germany's information services market will experience a strong 9% compound annual growth rate through the year 2000. In fact, Germany will account for 22% of the European market by the end of the decade, a whole percentage point up from its current market share position. This increase is worth just under \$1.3 billion—in absolute terms—by the end of the decade. Demand for client/server solutions and open systems is strong. UNIX-based packaged solutions are particularly resilient in the banking and manufacturing sectors. The application tools segment, particularly database management systems, is also growing at an aggressive rate. A new generation of managers is emerging who are less sensitive to the traditional data processing perspective, have no fear of losing their installed hardware base, and emphasize the strategic value of information rather than the infrastructure that provides and supports it.

Exhibit 2



Numbers are rounded.

Source: INPUT



Exhibit 2 shows INPUT's market forecast for the eight information services product/service categories for Germany for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A detailed forecast of the components of each product/service category is shown in the Forecast Database section. Professional services in Germany accounted for only 18% of the total German information services market in 1995. For instance, the market for custom software continues to decline due to the severe curtailment of the use of contract labor.

Outsourcing is another area in which Germany has historically lagged behind other European countries; in 1995, outsourcing accounted for just 2% of the total German market; this will grow to 5% by the year 2000. INPUT forecasts that this sector of the market will increase by 24% per annum over the next five years—a 4% increase from last year's estimate. Germany's historical aversion to outsourcing operations has begun to change rapidly and German outsourcing will exhibit the highest growth rate (over the next five years) of all European countries. This has been aided by the growth in SAP outsourcing, which is gradually changing from a mainframe-based processing service to a form of client/server systems management. The first contracts for SAP R/3 outsourcing began to appear toward the end of 1994. These contracts will be increasingly characterized by remote management of a distributed systems environment and will have much in common with other client/server management contracts. INPUT forecasts that growth in this area will be 10% per annum, producing a market worth just under DM 1 billion by the year 2000. The key sectors for growth will be manufacturing and financial services. IBM has already won a contract with the insurance organization Gothaer Versicherungen AG, valued at \$700 million over ten years.

The German market has always had a strong reliance on turnkey systems, accounting for 34% of the European turnkey market in 1995—twice the share of the U.K., its nearest rival. INPUT forecasts that the German turnkey market will grow by 8% to \$6.7 billion in the year 2000.

The conservative German market remains a difficult one for foreign software companies to penetrate. The industry is composed of a large number of smaller developers often dependent on a small number of clients. Users increasingly demand lower-priced packaged solutions and are becoming more familiar with powerful, user-friendly, programming tools. Pressures on prices will continue as fixed-cost contracts tend to be preferred to traditional time-and-materials-based arrangements.

IT consulting is also becoming a growth market in Germany as systems integration projects become more and more sophisticated. The sectors where demand is greatest are discrete manufacturing, retail, and government.



Leading Software and Services Vendors

The following table (Exhibit 3) notes Germany’s leading software and services vendors. The table offers a ranking, the vendor’s name and country of origin, and INPUT’s estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

Exhibit 3

Leading Software and Services Vendors—Germany, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 11.4             |
| 2       | SNI                     | Germany           | 7.6              |
| 3       | Datev                   | Germany           | 3.6              |
| 4       | SAP                     | Germany           | 3.1              |
| 5       | Digital Equipment Corp. | United States     | 2.9              |
| 6       | debis Systemhaus        | Germany           | 2.5              |
| 7       | EDS                     | United States     | 2.2              |
| 8       | Reuters                 | United Kingdom    | 2.1              |
| 9       | Microsoft               | United States     | 1.8              |
| 10      | Compunet                | Germany           | 1.0              |

Source: INPUT

IT Spending

The following table (Exhibit 4) offers INPUT’s estimate of IT spending in Germany. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

## Exhibit 4

**1995 IT Spending—Germany**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 5,850                                       | 9                             |
| Internal Staff           | 23,400                                      | 35                            |
| Equipment                | 9,150                                       | 14                            |
| Equipment Services       | 4,400                                       | 7                             |
| Facilities               | 5,500                                       | 8                             |
| Information Services     | 18,850                                      | 28                            |
| <b>Total IT Spending</b> | <b>67,150</b>                               | <b>100</b>                    |

*Numbers are rounded. Percentage totals may not add to 100%.*

*Source: INPUT*

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for Germany, for the period 1995-2000.

Exhibit 5

### Information Services Market Germany, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 17400      | 8%               | 18800      | 20700      | 22600      | 24500      | 26900      | 29300      | 9%             |
| <b>Professional Services</b>    | 3400       | 3%               | 3500       | 3600       | 3800       | 3900       | 4100       | 4100       | 3%             |
| - IS Consulting                 | 600        | 12%              | 670        | 750        | 860        | 950        | 1050       | 1150       | 11%            |
| - Education & Training          | 710        | 8%               | 770        | 840        | 900        | 970        | 1030       | 1090       | 7%             |
| - Software Development          | 2000       | -2%              | 2000       | 2000       | 2000       | 1900       | 1900       | 1800       | -2%            |
| - Application Management        | 21         | 36%              | 29         | 39         | 48         | 61         | 77         | 90         | 25%            |
| <b>Systems Integration</b>      | 710        | 14%              | 810        | 870        | 1000       | 1100       | 1230       | 1390       | 11%            |
| - Equipment                     | 200        | 6%               | 210        | 180        | 180        | 190        | 200        | 220        | 1%             |
| - Applications Software         | 145        | 21%              | 175        | 186        | 228        | 274        | 332        | 388        | 17%            |
| - Systems Software              | 51         | 9%               | 55         | 62         | 69         | 77         | 86         | 97         | 12%            |
| - Professional Services         | 300        | 7%               | 320        | 420        | 480        | 500        | 550        | 610        | 14%            |
| - Other                         | 36         | 11%              | 40         | 35         | 39         | 55         | 61         | 70         | 12%            |
| <b>Outsourcing</b>              | 310        | 58%              | 490        | 650        | 830        | 1050       | 1250       | 1460       | 24%            |
| - Platform Operations           | 60         | 15%              | 70         | 80         | 90         | 110        | 120        | 130        | 12%            |
| - Applications Operations       | 180        | 80%              | 320        | 430        | 560        | 710        | 840        | 970        | 25%            |
| - Desktop Services              | 68         | 38%              | 94         | 129        | 174        | 226        | 290        | 368        | 31%            |
| <b>Processing Services</b>      | 1680       | 8%               | 1810       | 1970       | 2130       | 2290       | 2390       | 2550       | 7%             |
| - Transaction Processing        | 1390       | 7%               | 1480       | 1610       | 1710       | 1840       | 1900       | 2000       | 6%             |
| - Utility Processing            | 80         | 0%               | 80         | 80         | 80         | 80         | 80         | 80         | 0%             |
| - Other Processing              | 230        | 13%              | 250        | 290        | 330        | 370        | 420        | 460        | 13%            |
| <b>Network Services</b>         | 1150       | 15%              | 1320       | 1550       | 1860       | 2220       | 2660       | 3240       | 20%            |
| - Electronic Information Svcs   | 770        | 10%              | 850        | 950        | 1050       | 1120       | 1190       | 1260       | 8%             |
| - Network Applications          | 250        | 34%              | 340        | 460        | 650        | 910        | 1250       | 1720       | 38%            |
| - Network Management            | 120        | 8%               | 130        | 150        | 160        | 180        | 210        | 250        | 14%            |
| <b>Applications SW Products</b> | 2400       | 14%              | 2700       | 3400       | 3800       | 4200       | 4900       | 5500       | 15%            |
| - Mainframe                     | 250        | -5%              | 240        | 230        | 220        | 210        | 210        | 200        | -3%            |
| - Minicomputer                  | 680        | 10%              | 740        | 810        | 910        | 1050       | 1220       | 1460       | 15%            |
| - Workstation/PC                | 1500       | 18%              | 1700       | 2300       | 2700       | 2900       | 3400       | 3800       | 17%            |
| <b>Systems SW Products</b>      | 3400       | 6%               | 3600       | 3850       | 3950       | 4030       | 4210       | 4300       | 4%             |
| - Mainframe                     | 1550       | -4%              | 1480       | 1420       | 1320       | 1160       | 1030       | 870        | -10%           |
| - Minicomputer                  | 1000       | 3%               | 1030       | 1100       | 1160       | 1230       | 1290       | 1350       | 6%             |
| - Workstation/PC                | 870        | 23%              | 1070       | 1330       | 1470       | 1640       | 1890       | 2110       | 15%            |
| <b>Turnkey Systems</b>          | 4390       | 4%               | 4580       | 4840       | 5290       | 5680       | 6190       | 6710       | 8%             |
| - Equipment                     | 2130       | 0%               | 2130       | 2190       | 2260       | 2320       | 2390       | 2450       | 3%             |
| - Applications Software         | 840        | 12%              | 940        | 1000       | 1190       | 1320       | 1550       | 1740       | 13%            |
| - Systems Software              | 297        | 2%               | 303        | 319        | 332        | 352        | 368        | 384        | 5%             |
| - Professional Services         | 1130       | 9%               | 1230       | 1340       | 1510       | 1680       | 1900       | 2100       | 11%            |



# Worldwide

## Information Services Program

COUNTRY PROFILES

EUROPE

## The Mediterranean and Ireland

Greece, Portugal, Spain and Ireland

September 1996

### Geographic Area Definition

For the purposes of INPUT's Worldwide Information Services Program, Greece, Portugal, and Spain (the Mediterranean countries) and Ireland are considered together in this consolidated profile.

### Area Economic Overview

With slow growth, a large fiscal deficit, and high inflation, Greece's economic situation remains somewhat uncertain. Like Portugal, output grew by only 1% in 1994. This year's forecast growth rate is 1.5%, half of what other OECD countries are expected to produce. In preparation for the European monetary union, Greece has a medium-term "convergence" program to reduce the deficit to 1% by 1999. To reach that level, the government plans to cut expenditures severely and continue tight fiscal policies. Reducing inflation will also be crucial. Consumer prices rose by 11% last year, and consumer demand remains weak because of continued static disposable income levels.

After a deep recession in 1993, Portugal's economy began to recover modestly last year. Its GDP grew by 1.0%, well below the OECD average of 2.8%. However, its prospects look good: OECD estimates include 2.6% growth in 1995 and 2.9% a year later, the latter equal to the OECD average for 1996. Portugal's unemployment rate of 6.7% remains below the OECD average of 8.2%, mainly because its labor market is extremely flexible. But the proportion of unemployed who have been out of work for over a year has risen from 27% in 1992 to over 34% in 1994.

The Spanish economy is characterized by high unemployment, although inflation is in the middle range for EC economies. Economic problems are driven by rigid labor laws, non-competitive state industries and an expensive social security system. The public sector



deficit stood at 5.8% of GDP in 1995. The government plans to reduce this to 3% by 1997 in order to join the single European currency two years later, but many economists agree that there seems little chance that Spain will meet this target.

Being the fastest growing economy in the European Union, with GDP rising at more than 5% in 1994, Ireland is forecast to continue at close to a 5% growth rate for the next two years, fueled by increases in both personal consumption and business investment. The devaluation of the Irish pound by 10% in early 1993 removed pressure on interest rates but did not increase inflation. Despite brisk growth, Ireland has made few inroads into its high level of unemployment. About 16% of the labor force is out of work. Among OECD countries, only Spain and Finland have higher rates of unemployment.

Key economic indicators are summarized in Exhibit 1. Inflation is the average projected for the period 1995-2000.

Exhibit 1

Key Economic Indicators

| Country  | GDP Growth Rate |      | Inflation Rate | Unemployment Rate | Exchange Rate |
|----------|-----------------|------|----------------|-------------------|---------------|
|          | 1995            | 1996 |                |                   |               |
| Greece   | 1.5%            | 2.3% | 5.3%           | 10.1%             | 240.6         |
| Ireland  | 5.0%            | 4.6% | 2.8%           | 16.0%             | 0.65          |
| Portugal | 2.6%            | 2.9% | 3.8%           | 6.7%              | 159.2         |
| Spain    | 2.9%            | 3.3% | 2.6%           | 24.5%             | 131.6         |

Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995

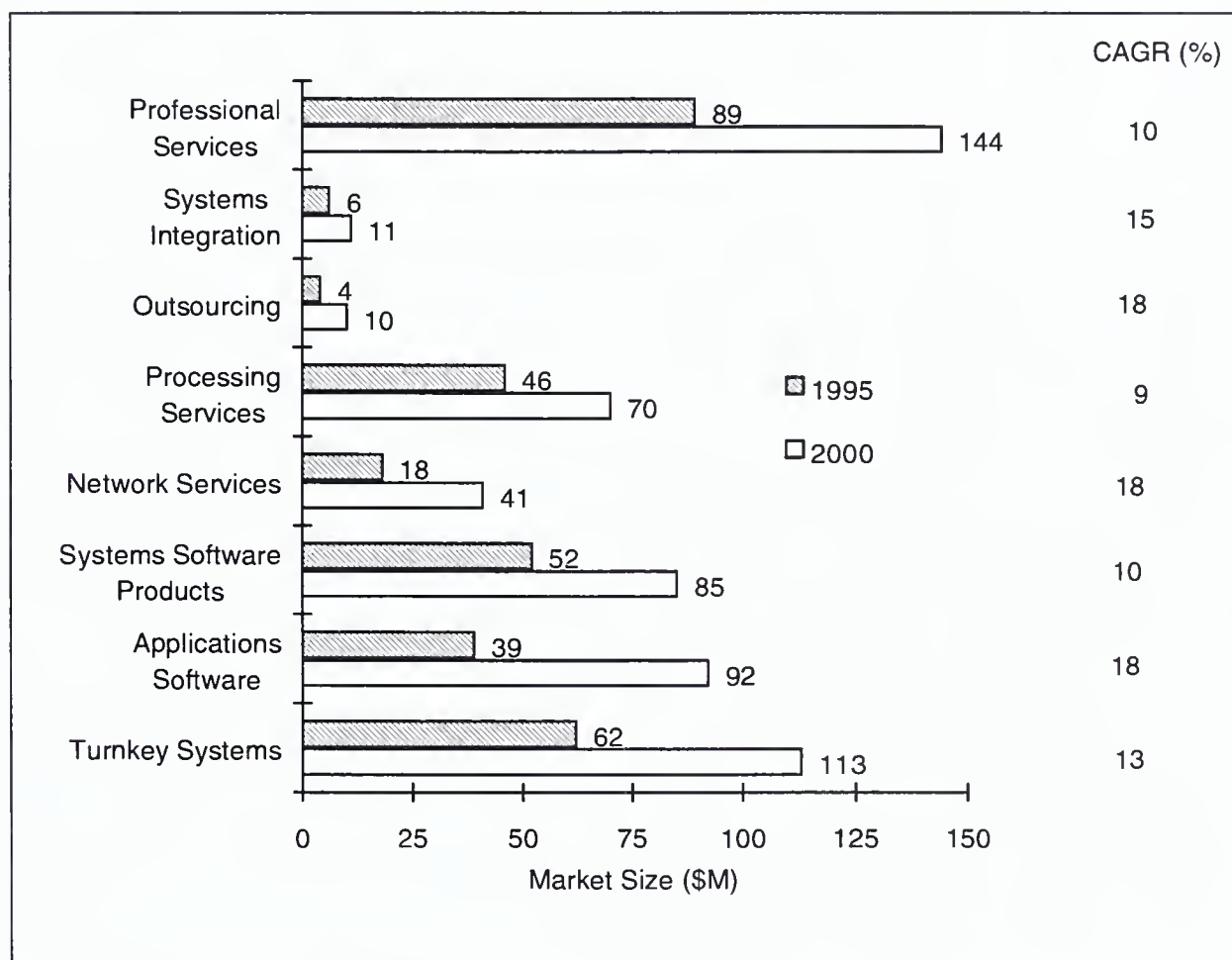
Information Services Market Forecast

The four profiled countries' share of the European market will increase from 4.2% in 1995 to 4.5% by the year 2000, primarily due to the strong performance of Spain, which has the largest information services market in this country grouping and will show a 10% growth (up from 7% in 1995) over the next five years.

Exhibits 2 to 5 summarize INPUT's market forecast for each country across the eight information services categories for the years 1995 and 2000 in millions of U.S.\$, and includes the five-year compound annual growth rate (CAGR) percentage. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
Greece, 1995 - 2000**

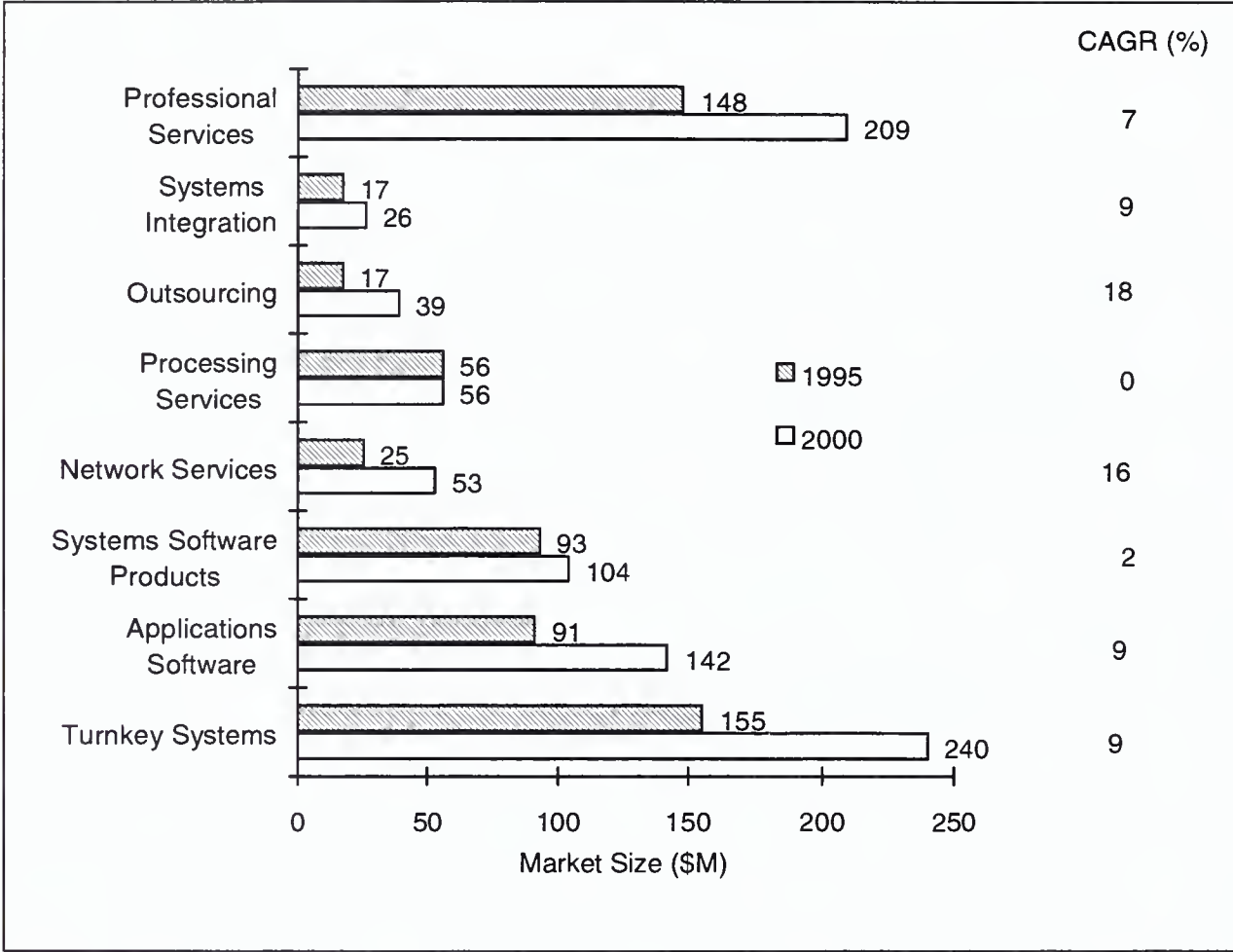


Source: INPUT

Greece and Portugal are both working from a small base and therefore exhibit high rates of growth in virtually all areas. As in Ireland, the largest segment in the Greek market is professional services, due to the domination of custom software development. The Greek market will be worth \$0.6 billion by the end of the decade.

Exhibit 3

Market Forecast by Product/Service Category  
Ireland, 1995 - 2000

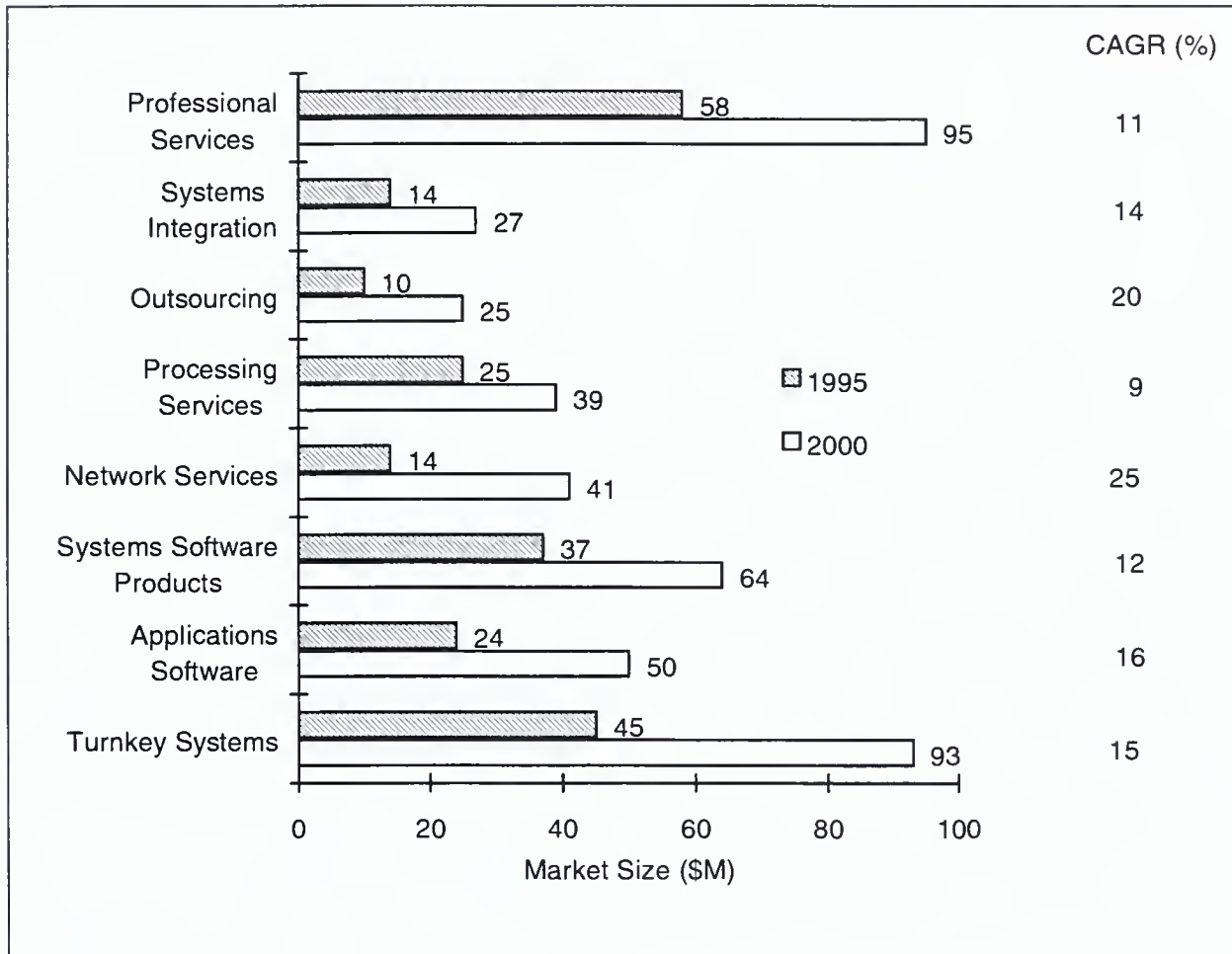


Source: INPUT

The Irish market is characterized by steady growth in both professional services (7%) and turnkey systems, the only areas where growth is above the European average rate. In 1994, professional services was the largest segment of the Irish market. Ireland will see significant movement in the outsourcing and network services markets, both of which are growing at double-digit rates—18% and 16%, respectively. Overall, the Irish market will grow at 8%, reaching almost \$0.9 billion by the year 2000.

Exhibit 4

**Market Forecast by Product/Service Category  
Portugal, 1995 - 2000**



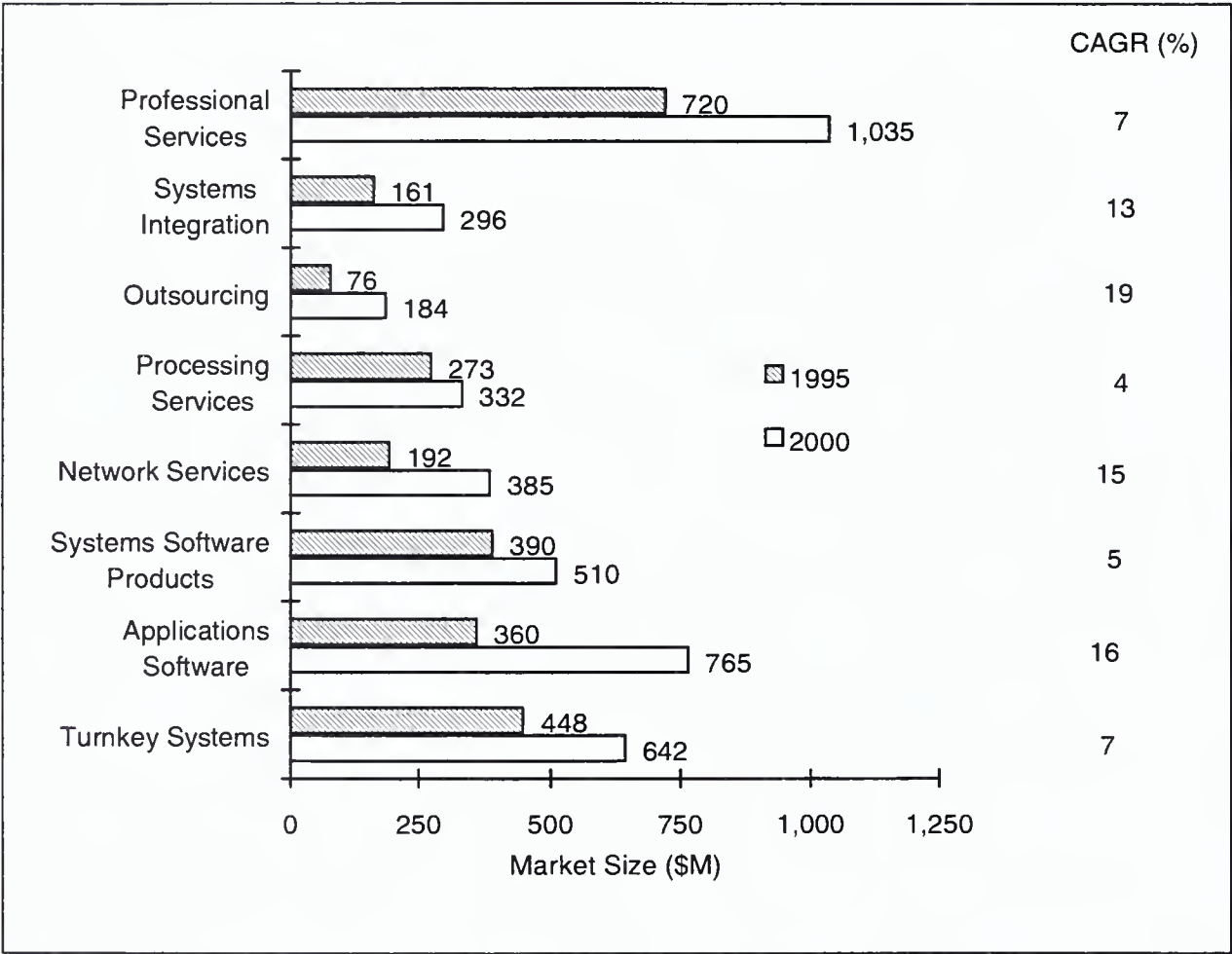
Source: INPUT

Portugal is a slightly smaller market than Greece, and will be valued at \$0.4 billion by the year 2000. It has a growth rate of 14% over the next five years, with network services (growing at 25%) and outsourcing (20%) providing the major opportunities. Desktop services (an embryonic market) will grow at 27%, while the workstation/PC platforms will consume the bulk of software products sold in this marketplace.



Exhibit 5

Market Forecast by Product/Service Category  
Spain, 1995 - 2000



Source: INPUT

The market for software and services in Spain (the largest of the four markets in this grouping) has been affected by a rapidly decelerating economy and an austere economic policy. In particular, vendors positioned in the public sector have faced difficult conditions due to severe reductions in public spending. Competitive challenges are also increasing as the IT market rapidly integrates with the European Union. Local software and services vendors are either being acquired by German, French and U.S.-based organizations or competing directly with them as they set up local offices.

Government and banking and finance are the two most dynamic sectors. Public institutions are facing restructuring as the authorities reorganize their assets and seek to exploit their technological potential. This trend will increase as the government seeks to utilize its assets fully. Due to mergers and acquisitions in the banking sector, there has been a significant increase in demand for systems integration and outsourcing services.

The Spanish market will grow from \$2.6 billion in 1995 to more than \$4.1 billion by the end of the decade—a 10% growth rate. IS consulting, application software, outsourcing, and network services will continue to provide good growth opportunities. Network applications will grow strongly over the next five years (22%) as the major Spanish telecom operator, Telefonica SA (which has a significant presence in the information services market) continues to invest in infrastructure development.

## Leading Software and Services Vendors

The following tables (Exhibits 6 to 9) notes the various countries' leading software and services vendors. Each table offers a ranking, the vendor's name and country of origin, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

Exhibit 6

### Leading Software and Services Vendors—Greece, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 9.0              |
| 2       | Andersen Consulting     | United States     | 7.6              |
| 3       | Digital Equipment Corp. | United States     | 4.3              |
| 4       | Microsoft               | United States     | 2.2              |
| 5       | Computer Associates     | United States     | 2.1              |
| 6=      | Reuters                 | United Kingdom    | 2.0              |
| 6=      | GEIS                    | United States     | 2.0              |
| 8       | SNI                     | Germany           | 1.4              |
| 9       | Unisys                  | United States     | 1.3              |
| 10      | Bull                    | France            | 1.2              |

Source: INPUT

Exhibit 7

Leading Software and Services Vendors—Ireland, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 8.2              |
| 2       | Digital Equipment Corp. | United States     | 4.1              |
| 3=      | Reuters                 | United Kingdom    | 2.7              |
| 3=      | Unisys                  | United States     | 2.7              |
| 3=      | Andersen Consulting     | United States     | 2.7              |
| 3=      | ICL                     | U.K./Japan        | 2.7              |
| 3=      | Microsoft               | United States     | 2.7              |
| 8=      | SNI                     | Germany           | 1.4              |
| 8=      | HP                      | United States     | 1.4              |
| 8=      | Computer Associates     | United States     | 1.4              |

Source: INPUT

Exhibit 8

Leading Software and Services Vendors—Portugal, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 20.9             |
| 2       | Andersen Consulting     | United States     | 15.6             |
| 3       | Unisys                  | United States     | 7.1              |
| 4       | Digital Equipment Corp. | United States     | 6.1              |
| 5       | EDS                     | United States     | 6.0              |
| 6       | ICL                     | U.K./Japan        | 5.0              |
| 7       | SNI                     | Germany           | 4.9              |
| 8       | Reuters                 | United Kingdom    | 4.4              |
| 9       | GEIS                    | United States     | 3.4              |
| 10      | HP                      | United States     | 3.3              |

Source: INPUT

## Exhibit 9

**Leading Software and Services Vendors—Spain, 1994**

| <b>Ranking</b> | <b>Company Name</b> | <b>Country of Origin</b> | <b>Market Share (%)</b> |
|----------------|---------------------|--------------------------|-------------------------|
| 1              | IBM                 | United States            | 9.3                     |
| 2              | Andersen Consulting | United States            | 8.2                     |
| 3              | Eritel              | Spain                    | 3.5                     |
| 4              | Reuters             | United Kingdom           | 2.5                     |
| 5              | HP                  | United States            | 2.2                     |
| 6=             | EDS                 | United States            | 2.1                     |
| 6=             | SNI                 | Germany                  | 2.1                     |
| 6=             | Microsoft           | United States            | 2.1                     |
| 9              | Sema                | France                   | 2.0                     |
| 10             | Computer Associates | United States            | 1.9                     |

*Source: INPUT***IT Spending**

Exhibits 10 to 13 offer INPUT's estimate of IT spending in each of the four countries. Spending is segmented into six categories, showing both dollar amounts (in U.S.\$ billions) and IT spending (%) for each category.

The IT "equipment" category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the "equipment" subcategories of their respective information services product/service categories and are identified in the Forecast Database.



Exhibit 10

1995 IT Spending—Greece

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 120                                 | 9                      |
| Internal Staff       | 440                                 | 35                     |
| Equipment            | 230                                 | 18                     |
| Equipment Services   | 35                                  | 3                      |
| Facilities           | 130                                 | 10                     |
| Information Services | 320                                 | 25                     |
| Total IT Spending    | 1,275                               | 100                    |

Numbers are rounded.

Source: INPUT

Exhibit 11

1995 IT Spending—Ireland

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 120                                 | 7                      |
| Internal Staff       | 400                                 | 22                     |
| Equipment            | 430                                 | 24                     |
| Equipment Services   | 110                                 | 6                      |
| Facilities           | 120                                 | 7                      |
| Information Services | 600                                 | 34                     |
| Total IT Spending    | 1,780                               | 100                    |

Numbers are rounded.

Source: INPUT

## Exhibit 12

## 1995 IT Spending—Portugal

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 110                                 | 9                      |
| Internal Staff           | 390                                 | 31                     |
| Equipment                | 300                                 | 24                     |
| Equipment Services       | 120                                 | 10                     |
| Facilities               | 110                                 | 9                      |
| Information Services     | 230                                 | 18                     |
| <b>Total IT Spending</b> | <b>1,260</b>                        | <b>100</b>             |

Numbers are rounded.

Source: INPUT

## Exhibit 13

## 1995 IT Spending—Spain

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 970                                 | 10                     |
| Internal Staff           | 2,700                               | 27                     |
| Equipment                | 2,050                               | 20                     |
| Equipment Services       | 890                                 | 9                      |
| Facilities               | 930                                 | 9                      |
| Information Services     | 2,600                               | 26                     |
| <b>Total IT Spending</b> | <b>10,140</b>                       | <b>100</b>             |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibits 14 to 17) for the various countries, for the period 1995-2000.

## Exhibit 14

### Information Services Market Greece, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 287        | 10%              | 316        | 362        | 403        | 449        | 507        | 565        | 12%            |
| <b>Professional Services</b>    | 81         | 9%               | 89         | 97         | 106        | 118        | 131        | 144        | 10%            |
| - IS Consulting                 | 9          | 11%              | 10         | 12         | 13         | 15         | 17         | 19         | 13%            |
| - Education & Training          | 7          | 6%               | 8          | 8          | 9          | 9          | 10         | 11         | 7%             |
| - Software Development          | 65         | 9%               | 71         | 77         | 84         | 94         | 103        | 114        | 10%            |
| - Application Management        | 0          | 0%               | 0          | 0          | 0          | 0          | 0          | 0          | 0%             |
| <b>Systems Integration</b>      | 5          | 13%              | 6          | 7          | 8          | 9          | 10         | 11         | 15%            |
| - Equipment                     | 1          | 5%               | 1          | 1          | 1          | 1          | 2          | 2          | 6%             |
| - Applications Software         | 1          | 30%              | 1          | 1          | 2          | 2          | 2          | 3          | 27%            |
| - Systems Software              | 0          | 15%              | 0          | 1          | 1          | 1          | 1          | 1          | 12%            |
| - Professional Services         | 2          | 14%              | 3          | 3          | 4          | 4          | 5          | 5          | 15%            |
| - Other                         | 0          | 15%              | 0          | 1          | 1          | 1          | 1          | 1          | 12%            |
| <b>Outsourcing</b>              | 4          | 24%              | 4          | 5          | 6          | 7          | 9          | 10         | 18%            |
| - Platform Operations           | 1          | 17%              | 1          | 1          | 2          | 2          | 2          | 2          | 15%            |
| - Applications Operations       | 2          | 20%              | 3          | 3          | 4          | 4          | 6          | 6          | 19%            |
| - Desktop Services              | 0          | 19%              | 0          | 0          | 1          | 1          | 1          | 1          | 27%            |
| <b>Processing Services</b>      | 42         | 9%               | 46         | 50         | 54         | 59         | 65         | 70         | 9%             |
| - Transaction Processing        | 37         | 9%               | 41         | 44         | 48         | 53         | 58         | 63         | 9%             |
| - Utility Processing            | 2          | 5%               | 2          | 2          | 2          | 2          | 2          | 2          | 5%             |
| - Other Processing              | 3          | 9%               | 4          | 4          | 4          | 5          | 5          | 5          | 8%             |
| <b>Network Services</b>         | 15         | 16%              | 18         | 21         | 25         | 30         | 35         | 41         | 18%            |
| - Electronic Information Svcs   | 10         | 13%              | 11         | 12         | 14         | 16         | 18         | 20         | 13%            |
| - Network Applications          | 5          | 25%              | 6          | 8          | 10         | 13         | 16         | 20         | 26%            |
| - Network Management            | 1          | 10%              | 1          | 1          | 1          | 1          | 1          | 1          | 14%            |
| <b>Applications SW Products</b> | 33         | 19%              | 39         | 52         | 62         | 69         | 81         | 92         | 18%            |
| - Mainframe                     | 3          | -3%              | 2          | 2          | 2          | 2          | 2          | 2          | -3%            |
| - Minicomputer                  | 9          | 15%              | 10         | 11         | 13         | 15         | 18         | 20         | 16%            |
| - Workstation/PC                | 22         | 21%              | 27         | 39         | 46         | 51         | 61         | 70         | 21%            |
| <b>Systems SW Products</b>      | 48         | 9%               | 52         | 59         | 64         | 70         | 77         | 85         | 10%            |
| - Mainframe                     | 19         | -4%              | 18         | 17         | 17         | 16         | 16         | 16         | -2%            |
| - Minicomputer                  | 17         | 12%              | 19         | 22         | 25         | 29         | 33         | 37         | 14%            |
| - Workstation/PC                | 13         | 22%              | 16         | 20         | 22         | 25         | 29         | 32         | 16%            |
| <b>Turnkey Systems</b>          | 57         | 10%              | 62         | 69         | 77         | 88         | 100        | 113        | 13%            |
| - Equipment                     | 27         | 6%               | 29         | 31         | 33         | 36         | 40         | 43         | 9%             |
| - Applications Software         | 12         | 14%              | 14         | 16         | 18         | 22         | 26         | 30         | 17%            |
| - Systems Software              | 3          | 6%               | 3          | 3          | 4          | 4          | 4          | 5          | 9%             |
| - Professional Services         | 15         | 13%              | 16         | 19         | 22         | 26         | 30         | 35         | 16%            |

Numbers are rounded.

Source: INPUT

## Exhibit 15

### Information Services Market Ireland, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 564        | 7%               | 603        | 657        | 703        | 750        | 811        | 866        | 8%             |
| <b>Professional Services</b>    | 145        | 2%               | 148        | 156        | 164        | 176        | 193        | 209        | 7%             |
| - IS Consulting                 | 17         | 0%               | 17         | 18         | 19         | 20         | 22         | 23         | 6%             |
| - Education & Training          | 14         | 0%               | 14         | 14         | 16         | 16         | 17         | 17         | 4%             |
| - Software Development          | 114        | 3%               | 117        | 124        | 130        | 141        | 155        | 168        | 7%             |
| - Application Management        | 0          | 0%               | 0          | 0          | 0          | 0          | 0          | 0          | 0%             |
| <b>Systems Integration</b>      | 14         | 22%              | 17         | 17         | 19         | 23         | 23         | 26         | 9%             |
| - Equipment                     | 3          | 0%               | 3          | 3          | 3          | 5          | 3          | 5          | 8%             |
| - Applications Software         | 2          | 100%             | 3          | 3          | 3          | 5          | 6          | 8          | 20%            |
| - Systems Software              | 2          | 0%               | 2          | 2          | 2          | 2          | 2          | 2          | 0%             |
| - Professional Services         | 6          | 25%              | 8          | 8          | 9          | 11         | 11         | 11         | 7%             |
| - Other                         | 2          | 0%               | 2          | 2          | 2          | 2          | 2          | 2          | 0%             |
| <b>Outsourcing</b>              | 14         | 22%              | 17         | 20         | 23         | 26         | 33         | 39         | 18%            |
| - Platform Operations           | 8          | 20%              | 9          | 11         | 12         | 14         | 17         | 19         | 15%            |
| - Applications Operations       | 5          | 33%              | 6          | 6          | 8          | 8          | 11         | 14         | 18%            |
| - Desktop Services              | 2          | 0%               | 2          | 3          | 3          | 5          | 5          | 6          | 32%            |
| <b>Processing Services</b>      | 56         | 0%               | 56         | 56         | 56         | 55         | 56         | 56         | 0%             |
| - Transaction Processing        | 42         | -4%              | 40         | 40         | 39         | 37         | 37         | 36         | -2%            |
| - Utility Processing            | 2          | 0%               | 2          | 2          | 2          | 2          | 2          | 2          | 0%             |
| - Other Processing              | 12         | 6%               | 13         | 14         | 15         | 16         | 17         | 18         | 6%             |
| <b>Network Services</b>         | 22         | 14%              | 25         | 29         | 34         | 40         | 45         | 53         | 16%            |
| - Electronic Information Svcs   | 12         | 13%              | 14         | 16         | 19         | 21         | 23         | 26         | 14%            |
| - Network Applications          | 8          | 20%              | 9          | 11         | 13         | 16         | 19         | 22         | 19%            |
| - Network Management            | 2          | 0%               | 2          | 2          | 2          | 3          | 3          | 3          | 15%            |
| <b>Applications SW Products</b> | 82         | 11%              | 91         | 110        | 121        | 125        | 134        | 142        | 9%             |
| - Mainframe                     | 8          | 0%               | 8          | 6          | 6          | 6          | 5          | 5          | -10%           |
| - Minicomputer                  | 20         | 4%               | 21         | 22         | 24         | 26         | 27         | 29         | 7%             |
| - Workstation/PC                | 54         | 14%              | 62         | 80         | 90         | 93         | 102        | 108        | 12%            |
| <b>Systems SW Products</b>      | 91         | 2%               | 93         | 97         | 100        | 103        | 104        | 104        | 2%             |
| - Mainframe                     | 39         | -8%              | 36         | 33         | 32         | 30         | 28         | 26         | -6%            |
| - Minicomputer                  | 29         | 3%               | 30         | 31         | 33         | 34         | 35         | 36         | 3%             |
| - Workstation/PC                | 23         | 17%              | 27         | 33         | 36         | 39         | 42         | 43         | 10%            |
| <b>Turnkey Systems</b>          | 139        | 11%              | 155        | 170        | 186        | 201        | 224        | 240        | 9%             |
| - Equipment                     | 71         | 5%               | 75         | 80         | 84         | 87         | 91         | 95         | 5%             |
| - Applications Software         | 29         | 16%              | 34         | 39         | 44         | 50         | 57         | 65         | 14%            |
| - Systems Software              | 5          | 0%               | 5          | 5          | 5          | 5          | 5          | 5          | 0%             |
| - Professional Services         | 37         | 15%              | 43         | 48         | 54         | 61         | 69         | 77         | 13%            |

Numbers are rounded.

Source: INPUT



## Exhibit 16

### Information Services Market Portugal, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 198        | 14%              | 226        | 262        | 299        | 344        | 388        | 433        | 14%            |
| <b>Professional Services</b>    | 52         | 12%              | 58         | 64         | 71         | 79         | 87         | 95         | 11%            |
| - IS Consulting                 | 7          | 17%              | 9          | 10         | 12         | 14         | 16         | 18         | 16%            |
| - Education & Training          | 6          | 12%              | 6          | 7          | 8          | 9          | 9          | 10         | 10%            |
| - Software Development          | 36         | 11%              | 40         | 43         | 47         | 52         | 56         | 59         | 8%             |
| - Application Management        | 3          | 9%               | 3          | 4          | 4          | 5          | 6          | 8          | 20%            |
| <b>Systems Integration</b>      | 12         | 16%              | 14         | 16         | 19         | 21         | 24         | 27         | 14%            |
| - Equipment                     | 3          | 11%              | 3          | 4          | 4          | 4          | 4          | 4          | 4%             |
| - Applications Software         | 2          | 32%              | 2          | 3          | 4          | 5          | 6          | 7          | 26%            |
| - Systems Software              | 1          | 1%               | 1          | 1          | 2          | 1          | 2          | 2          | 14%            |
| - Professional Services         | 5          | 18%              | 6          | 8          | 9          | 10         | 11         | 12         | 14%            |
| - Other                         | 1          | 1%               | 1          | 1          | 1          | 1          | 1          | 2          | 11%            |
| <b>Outsourcing</b>              | 8          | 20%              | 10         | 12         | 14         | 18         | 21         | 25         | 20%            |
| - Platform Operations           | 3          | 19%              | 3          | 4          | 4          | 5          | 5          | 6          | 15%            |
| - Applications Operations       | 4          | 20%              | 5          | 5          | 6          | 8          | 9          | 11         | 19%            |
| - Desktop Services              | 2          | 20%              | 2          | 3          | 3          | 5          | 6          | 8          | 27%            |
| <b>Processing Services</b>      | 22         | 13%              | 25         | 27         | 30         | 34         | 36         | 39         | 9%             |
| - Transaction Processing        | 20         | 11%              | 22         | 24         | 26         | 29         | 31         | 33         | 9%             |
| - Utility Processing            | 1          | 7%               | 1          | 1          | 1          | 1          | 1          | 1          | 4%             |
| - Other Processing              | 2          | 15%              | 2          | 3          | 3          | 4          | 4          | 5          | 14%            |
| <b>Network Services</b>         | 11         | 23%              | 14         | 17         | 22         | 28         | 34         | 41         | 25%            |
| - Electronic Information Svcs   | 7          | 21%              | 9          | 11         | 13         | 16         | 19         | 22         | 21%            |
| - Network Applications          | 3          | 34%              | 4          | 5          | 7          | 10         | 13         | 17         | 34%            |
| - Network Management            | 1          | 10%              | 1          | 1          | 1          | 1          | 2          | 2          | 14%            |
| <b>Applications SW Products</b> | 20         | 19%              | 24         | 31         | 36         | 41         | 45         | 50         | 16%            |
| - Mainframe                     | 1          | 5%               | 1          | 2          | 2          | 2          | 2          | 2          | 4%             |
| - Minicomputer                  | 6          | 11%              | 6          | 7          | 8          | 9          | 10         | 11         | 12%            |
| - Workstation/PC                | 13         | 22%              | 16         | 22         | 26         | 29         | 34         | 37         | 18%            |
| <b>Systems SW Products</b>      | 33         | 11%              | 37         | 43         | 47         | 53         | 58         | 64         | 12%            |
| - Mainframe                     | 13         | 0%               | 13         | 14         | 14         | 14         | 14         | 14         | 1%             |
| - Minicomputer                  | 12         | 14%              | 13         | 15         | 17         | 20         | 22         | 25         | 13%            |
| - Workstation/PC                | 8          | 27%              | 10         | 14         | 16         | 19         | 22         | 25         | 20%            |
| <b>Turnkey Systems</b>          | 40         | 14%              | 45         | 52         | 60         | 71         | 82         | 93         | 15%            |
| - Equipment                     | 19         | 10%              | 20         | 22         | 25         | 28         | 31         | 34         | 10%            |
| - Applications Software         | 8          | 20%              | 10         | 12         | 15         | 18         | 22         | 26         | 21%            |
| - Systems Software              | 2          | 12%              | 2          | 3          | 3          | 4          | 4          | 4          | 14%            |
| - Professional Services         | 11         | 18%              | 13         | 15         | 18         | 21         | 25         | 29         | 18%            |

Numbers are rounded.

Source: INPUT

## Exhibit 17

### Information Services Market Spain, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 2455       | 7%               | 2620       | 2905       | 3160       | 3440       | 3790       | 4140       | 10%            |
| <b>Professional Services</b>    | 690        | 4%               | 720        | 760        | 820        | 890        | 955        | 1035       | 7%             |
| - IS Consulting                 | 107        | 11%              | 118        | 133        | 152        | 175        | 202        | 228        | 14%            |
| - Education & Training          | 65         | 1%               | 65         | 67         | 70         | 74         | 77         | 82         | 5%             |
| - Software Development          | 515        | 3%               | 530        | 555        | 595        | 630        | 670        | 705        | 6%             |
| - Application Management        | 5          | 10%              | 6          | 7          | 8          | 10         | 13         | 15         | 21%            |
| <b>Systems Integration</b>      | 145        | 11%              | 161        | 181        | 203        | 225        | 255        | 296        | 13%            |
| - Equipment                     | 36         | 2%               | 37         | 40         | 39         | 39         | 41         | 45         | 4%             |
| - Applications Software         | 20         | 27%              | 26         | 31         | 41         | 50         | 61         | 77         | 25%            |
| - Systems Software              | 12         | 11%              | 13         | 15         | 16         | 18         | 20         | 21         | 10%            |
| - Professional Services         | 65         | 13%              | 74         | 85         | 96         | 106        | 120        | 139        | 13%            |
| - Other                         | 12         | -3%              | 11         | 11         | 12         | 14         | 13         | 15         | 6%             |
| <b>Outsourcing</b>              | 64         | 19%              | 76         | 92         | 112        | 132        | 158        | 184        | 19%            |
| - Platform Operations           | 30         | 17%              | 35         | 41         | 47         | 54         | 61         | 68         | 14%            |
| - Applications Operations       | 28         | 20%              | 34         | 42         | 53         | 64         | 76         | 91         | 22%            |
| - Desktop Services              | 6          | 20%              | 7          | 9          | 12         | 15         | 20         | 25         | 28%            |
| <b>Processing Services</b>      | 262        | 4%               | 273        | 282        | 293        | 306        | 318        | 332        | 4%             |
| - Transaction Processing        | 224        | 4%               | 233        | 240        | 250        | 261        | 272        | 284        | 4%             |
| - Utility Processing            | 17         | 2%               | 17         | 17         | 17         | 17         | 17         | 18         | 1%             |
| - Other Processing              | 23         | 5%               | 24         | 25         | 26         | 28         | 29         | 30         | 5%             |
| <b>Network Services</b>         | 171        | 12%              | 192        | 219        | 253        | 293        | 339        | 385        | 15%            |
| - Electronic Information Svcs   | 105        | 9%               | 115        | 128        | 142        | 160        | 177        | 190        | 11%            |
| - Network Applications          | 44         | 21%              | 53         | 65         | 79         | 98         | 120        | 142        | 22%            |
| - Network Management            | 22         | 10%              | 25         | 27         | 31         | 36         | 43         | 53         | 17%            |
| <b>Applications SW Products</b> | 320        | 13%              | 360        | 465        | 540        | 595        | 685        | 765        | 16%            |
| - Mainframe                     | 23         | -5%              | 22         | 21         | 20         | 20         | 19         | 19         | -3%            |
| - Minicomputer                  | 86         | 7%               | 92         | 101        | 110        | 120        | 131        | 143        | 9%             |
| - Workstation/PC                | 210        | 19%              | 250        | 345        | 410        | 450        | 535        | 600        | 19%            |
| <b>Systems SW Products</b>      | 375        | 5%               | 390        | 420        | 430        | 450        | 480        | 510        | 5%             |
| - Mainframe                     | 139        | -7%              | 130        | 121        | 113        | 107        | 102        | 98         | -6%            |
| - Minicomputer                  | 136        | 4%               | 142        | 148        | 154        | 164        | 174        | 184        | 5%             |
| - Workstation/PC                | 99         | 20%              | 119        | 151        | 164        | 180        | 206        | 228        | 14%            |
| <b>Turnkey Systems</b>          | 429        | 4%               | 448        | 480        | 511        | 555        | 603        | 642        | 7%             |
| - Equipment                     | 202        | 1%               | 204        | 212        | 219        | 230        | 243        | 250        | 4%             |
| - Applications Software         | 91         | 8%               | 99         | 110        | 121        | 136        | 152        | 167        | 11%            |
| - Systems Software              | 25         | 2%               | 25         | 27         | 28         | 30         | 32         | 33         | 5%             |
| - Professional Services         | 111        | 8%               | 120        | 131        | 143        | 159        | 177        | 192        | 10%            |

Numbers are rounded.

Source: INPUT





# Worldwide

## Information Services Program

COUNTRY PROFILE

EUROPE

## Italy

### Economic Overview

Italy's economic growth is expected to continue to be limited by both firm macroeconomic controls and slow growth in private consumption. After moderate growth in 1994 and 1995, business spending is expected to remain firm in 1996, offsetting to some degree reduced spending for private consumption. One of the factors limiting economic growth is the continued high unemployment rate, fueled in part by layoffs at a number of the larger Italian firms. However, employment is expected to increase as financial performance by Italian companies at all levels slowly improves in 1996. Even though business spending is expected to improve over 1995 levels in 1996, a decline in exports due to better performance of the lira will erode Italy's overall economic growth. Regardless, the business climate in Italy is getting better, as reflected in the improved purchasing power of its currency.

Exhibit 1

### Key Economic Indicators—Italy

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 2.7%  |
| - 1996                     | 2.9%  |
| Inflation Rate (1995-2000) | 3.2%  |
| Unemployment Rate          | 12.2% |
| Exchange Rate              | 1,620 |

Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995

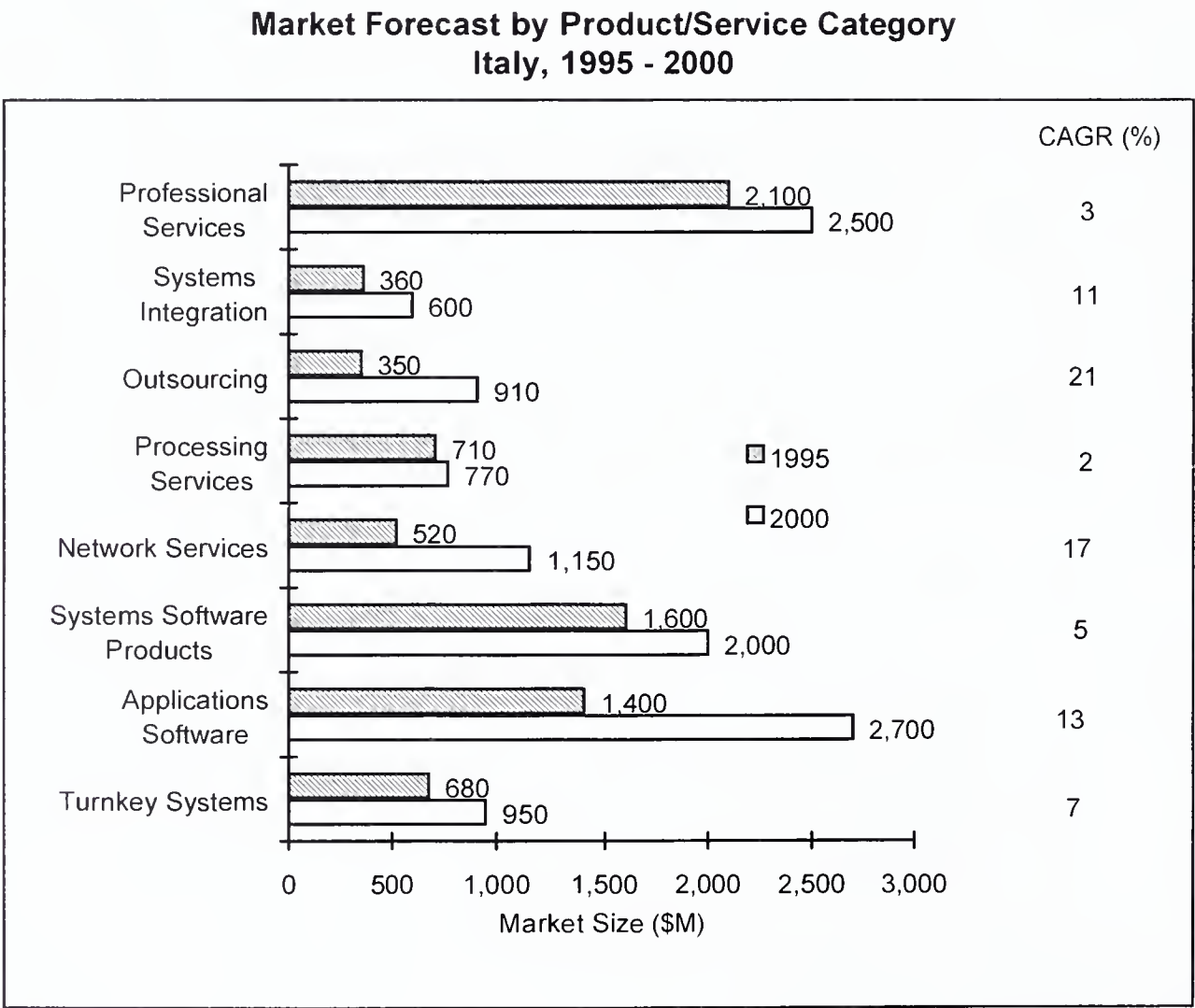


For the long term, losses in international markets due to a stronger lira driven by a more stable political climate and conservative fiscal policies (e.g. pension systems reforms that should help to reduce Italy’s budget deficit) will be more than offset by growing investor and consumer confidence in Italian products and services. Exhibit 1 notes key Italian economic measurements developed during the period indicated on the “Source” references.

Information Services Market Forecast

The Italian market is valued at \$7.8 billion in 1995 and will grow at 8% per annum, reaching a market size of \$11.5 billion by the year 2000. The Italian market is approximately half that of the U.K. and around 40% those of France and Germany. The market forecast for the eight information services product/service categories is shown in Exhibit 2. Key areas for growth are outsourcing, network services and applications software—all with growth rates above the European average.

Exhibit 2



Numbers are rounded.

Source: INPUT

Italian information services vendors, with the exception of Olivetti, are characterized by their dependence on the national market for the majority of their business. Finsiel, the largest Italian vendor, generates over 90% of its business from within Italy. The Italian market is composed of many small and medium-sized companies that are served on a local basis by software vendors. Systems software and applications software account for 21% and 18%, respectively, of the Italian market—well above the European average (16% and 14%, respectively). Such vendors have limited resources with which to address larger markets or to boost research and development activity. However, there is an increasing adoption of vertical market sectors and matrix-based structures that recognizes that a *niche* approach is more pertinent, given the limited resources available to such vendors. As with most sophisticated economies, the discrete manufacturing and banking and finance market sectors offer the most opportunity for information services vendors, followed by the national and local government and process manufacturing sectors.

Another approach is to leverage access to capital and markets through strategic partnerships. Again, Olivetti has been the most active in this area through its multimedia alliance with two American firms, Redgate Communications and Hughes Network Systems (part of GM), as well as consolidating its in-house multimedia interests. Through Omnitel Pronto Italia, Olivetti has also won Italy's second digital mobile phone license, again by forging links with two U.S. organizations, Bell Atlantic and AirTouch.

The threat represented by U.S. vendors entering the Italian market is growing rapidly. In 1993 EDS acquired the S&M Group, a local vendor focusing on the financial services sector. EDS has subsequently increased its share of the outsourcing market through other major contracts, including one with INA for ten years, valued at \$400 million. CSC and IBM ISSC are also adopting similar sector-specific strategies by concentrating on the manufacturing sector, often one of the early adopters of outsourcing in a country.

A detailed forecast of the components of each product/service category is shown in the Forecast Database section.

## Leading Software and Services Vendors

The following table (Exhibit 3) notes Italy's leading software and services vendors. The table offers a ranking, the vendor's name and country of origin, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

Exhibit 3

Leading Software and Services Vendors—Italy, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | Finsiel                 | Italy             | 12.4             |
| 2       | IBM                     | United States     | 11.8             |
| 3       | Olivetti                | Italy             | 8.7              |
| 4       | Digital Equipment Corp. | United States     | 3.2              |
| 5       | Reuters                 | United Kingdom    | 2.2              |
| 6=      | Andersen Consulting     | United States     | 1.6              |
| 6=      | Microsoft               | United States     | 1.6              |
| 8       | Cerved                  | Italy             | 1.5              |
| 9       | Bull                    | France            | 1.5              |
| 10      | Computer Associates     | United States     | 1.3              |
| 11      | Database Informatica    | Italy             | 1.3              |

Source: INPUT

IT Spending

The following table (Exhibit 4) offers INPUT’s estimate of IT spending in Italy. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

## Exhibit 4

**1995 IT Spending—Italy**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 2,150                                       | 8                             |
| Internal Staff           | 7,450                                       | 28                            |
| Equipment                | 4,550                                       | 17                            |
| Equipment Services       | 2,200                                       | 8                             |
| Facilities               | 2,600                                       | 10                            |
| Information Services     | 7,800                                       | 29                            |
| <b>Total IT Spending</b> | <b>26,750</b>                               | <b>100</b>                    |

*Numbers are rounded.**Source: INPUT***Information Services Forecast Database**

This section contains the complete information services forecast database (Exhibit 5) for Italy, for the period 1995-2000.



Exhibit 5

## Information Services Market Italy, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 7300       | 6%               | 7800       | 8600       | 9200       | 9900       | 10700      | 11500      | 8%             |
| <b>Professional Services</b>    | 2100       | 0%               | 2100       | 2100       | 2200       | 2200       | 2300       | 2500       | 3%             |
| - IS Consulting                 | 340        | 10%              | 370        | 390        | 420        | 470        | 540        | 610        | 10%            |
| - Education & Training          | 160        | 6%               | 170        | 170        | 180        | 190        | 210        | 220        | 5%             |
| - Software Development          | 1600       | -4%              | 1500       | 1500       | 1600       | 1600       | 1600       | 1600       | 1%             |
| - Application Management        | 19         | 10%              | 20         | 22         | 25         | 31         | 39         | 49         | 19%            |
| <b>Systems Integration</b>      | 330        | 9%               | 360        | 400        | 440        | 490        | 550        | 600        | 11%            |
| - Equipment                     | 90         | 1%               | 90         | 90         | 90         | 100        | 100        | 100        | 4%             |
| - Applications Software         | 59         | 16%              | 69         | 83         | 101        | 113        | 136        | 169        | 20%            |
| - Systems Software              | 23         | 11%              | 25         | 28         | 31         | 35         | 38         | 43         | 11%            |
| - Professional Services         | 150        | 12%              | 170        | 190        | 200        | 230        | 250        | 270        | 9%             |
| - Other                         | 7          | 9%               | 7          | 12         | 13         | 20         | 22         | 24         | 27%            |
| <b>Outsourcing</b>              | 270        | 33%              | 350        | 440        | 550        | 650        | 780        | 910        | 21%            |
| - Platform Operations           | 70         | 13%              | 80         | 90         | 100        | 120        | 130        | 140        | 12%            |
| - Applications Operations       | 150        | 40%              | 220        | 280        | 350        | 420        | 510        | 580        | 22%            |
| - Desktop Services              | 40         | 38%              | 56         | 71         | 93         | 117        | 148        | 185        | 27%            |
| <b>Processing Services</b>      | 710        | 0%               | 710        | 710        | 710        | 740        | 740        | 770        | 2%             |
| - Transaction Processing        | 640        | -2%              | 620        | 620        | 630        | 640        | 650        | 660        | 1%             |
| - Utility Processing            | 10         | 0%               | 10         | 10         | 10         | 10         | 10         | 10         | 0%             |
| - Other Processing              | 70         | 4%               | 70         | 80         | 80         | 90         | 100        | 100        | 7%             |
| <b>Network Services</b>         | 460        | 14%              | 520        | 610        | 700        | 820        | 960        | 1140       | 17%            |
| - Electronic Information Svcs   | 260        | 5%               | 270        | 290        | 300        | 310        | 310        | 310        | 3%             |
| - Network Applications          | 160        | 31%              | 210        | 270        | 350        | 450        | 590        | 740        | 29%            |
| - Network Management            | 40         | 8%               | 40         | 50         | 50         | 60         | 60         | 80         | 15%            |
| <b>Applications SW Products</b> | 1300       | 11%              | 1400       | 1800       | 2000       | 2200       | 2500       | 2700       | 13%            |
| - Mainframe                     | 90         | -6%              | 80         | 80         | 70         | 70         | 70         | 60         | -6%            |
| - Minicomputer                  | 300        | -8%              | 280        | 290        | 290        | 290        | 250        | 190        | -7%            |
| - Workstation/PC                | 900        | 20%              | 1100       | 1500       | 1700       | 1800       | 2200       | 2400       | 17%            |
| <b>Systems SW Products</b>      | 1500       | 8%               | 1600       | 1800       | 1900       | 1900       | 2000       | 2000       | 5%             |
| - Mainframe                     | 530        | -4%              | 510        | 480        | 450        | 430        | 410        | 380        | -6%            |
| - Minicomputer                  | 490        | 5%               | 520        | 550        | 560        | 580        | 590        | 600        | 3%             |
| - Workstation/PC                | 460        | 24%              | 570        | 740        | 810        | 870        | 970        | 1050       | 13%            |
| <b>Turnkey Systems</b>          | 670        | 2%               | 680        | 720        | 770        | 830        | 890        | 950        | 7%             |
| - Equipment                     | 330        | 3%               | 340        | 360        | 370        | 390        | 400        | 410        | 4%             |
| - Applications Software         | 160        | 0%               | 160        | 170        | 190        | 210        | 230        | 250        | 10%            |
| - Systems Software              | 8          | 8%               | 9          | 9          | 10         | 11         | 11         | 12         | 7%             |
| - Professional Services         | 170        | 2%               | 170        | 180        | 200        | 220        | 240        | 270        | 10%            |



## Nordic Countries

Denmark, Finland, Norway and Sweden

### Geographic Area Definition

The four Nordic countries—Sweden, Denmark, Norway and Finland—generally share a similar economic and business environment and, for the purposes of INPUT's Worldwide Information Services Program, are considered together in this consolidated "Nordic Countries" profile.

### Area Economic Overview

As can be seen in Exhibit 1, Key Economic Indicators, the economic growth rate is expected to decline in 1996 (from 1995 levels) for Denmark, Finland and Norway, and will increase slightly for Sweden. The largest decline in growth is for Finland, where continued high levels of unemployment slow the economy and GDP growth has dropped by 0.9%. (Note: The exchange rate in Exhibit 1 is in units of local currency per US \$1.)

Exhibit 1

Key Economic Indicators

| Country | GDP Growth Rate |      | Inflation Rate | Unemployment Rate | Exchange Rate |
|---------|-----------------|------|----------------|-------------------|---------------|
|         | 1995            | 1996 |                |                   |               |
| Denmark | 3.3%            | 2.9% | 2.8%           | 12.3%             | 10.90         |
| Finland | 4.8%            | 3.9% | 3.2%           | 22.0%             | 4.74          |
| Norway  | 2.9%            | 2.3% | 2.3%           | 8.4%              | 6.76          |
| Sweden  | 2.3%            | 2.5% | 2.1%           | 8.8%              | 7.43          |

Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995

Finland's inflation rate, at 3.2%, is the third highest of the 16 European countries monitored by INPUT, and is exceeded only by Portugal (3.8%) and Greece (5.3%). The exchange rates noted in the exhibit were taken from a January 1995 edition of the Financial Times and have been used to determine the US dollar values of the various markets identified in the balance of this document.

## Information Services Market Forecast

The Nordic region's share of the total European information services market will decline from 10.0% to 9.6% over the next five years. This is due to an increased share on the part of eastern Europe (an increase of 0.6% between 1995 and 2000) and growth in Spain, Portugal, Greece and Ireland (a 0.3% increase for these four countries in total over the next five years). By way of comparison, the top four countries' (Germany, France the United Kingdom (UK) and Italy) share will also decline slightly from 70.3% in 1994 to 69.7% by the year 2000.

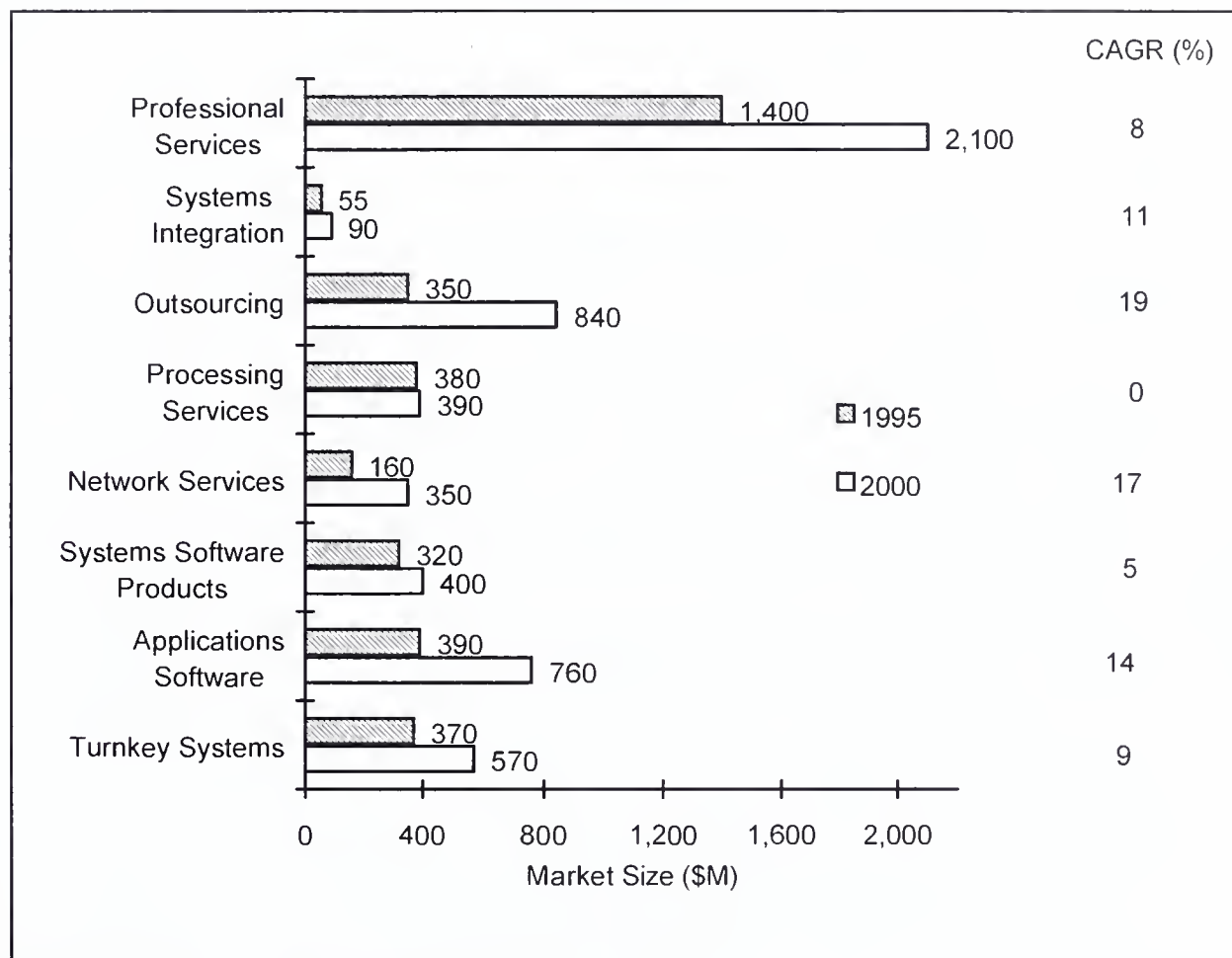
The major areas for growth within the Nordic region are professional services and application software. Apart from Norway, all other countries experienced above average growth rates in professional services. The Nordic region as a whole will increase its share of the professional services market from 11.3% in 1995 to 13.2% in the year 2000. This is due to strong growth in the Swedish market.

Professional services in Sweden accounted for 42% of the software and services market in 1994 as compared to the European average of 28%. Custom software development is the driving force in this sector growing at 7% in Sweden over the next five years, compared with a European average of 1%. The outlook is similar for outsourcing in Sweden. It has the highest compound growth rate of all the Nordic countries (19%) and outsourcing accounts for 9% of the total Swedish software and services market compared to a European average of 4%. Outsourcing will increase to a 15% share of the Swedish market by the year 2000 which is almost on a par with the UK. (Outsourcing will account for 16% of the UK software and services market in the year 2000). Outsourcing in Sweden is characterized by a strong focus on the public sector—in particular local government and health services. The health services sector is, at present, a better established market in Sweden than in the UK. Sweden is the largest of the Nordic markets and is also the fastest growing. INPUT forecasts 10% growth over the next five years. Exhibit 2 shows INPUT's market forecast for the eight information services product/service categories for Sweden for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A detailed forecast of the components of each product/service category is shown in the section, Forecast Database.



Exhibit 2

**Market Forecast by Product/Service Category  
Sweden, 1995 - 2000**



Numbers are rounded

Source: INPUT

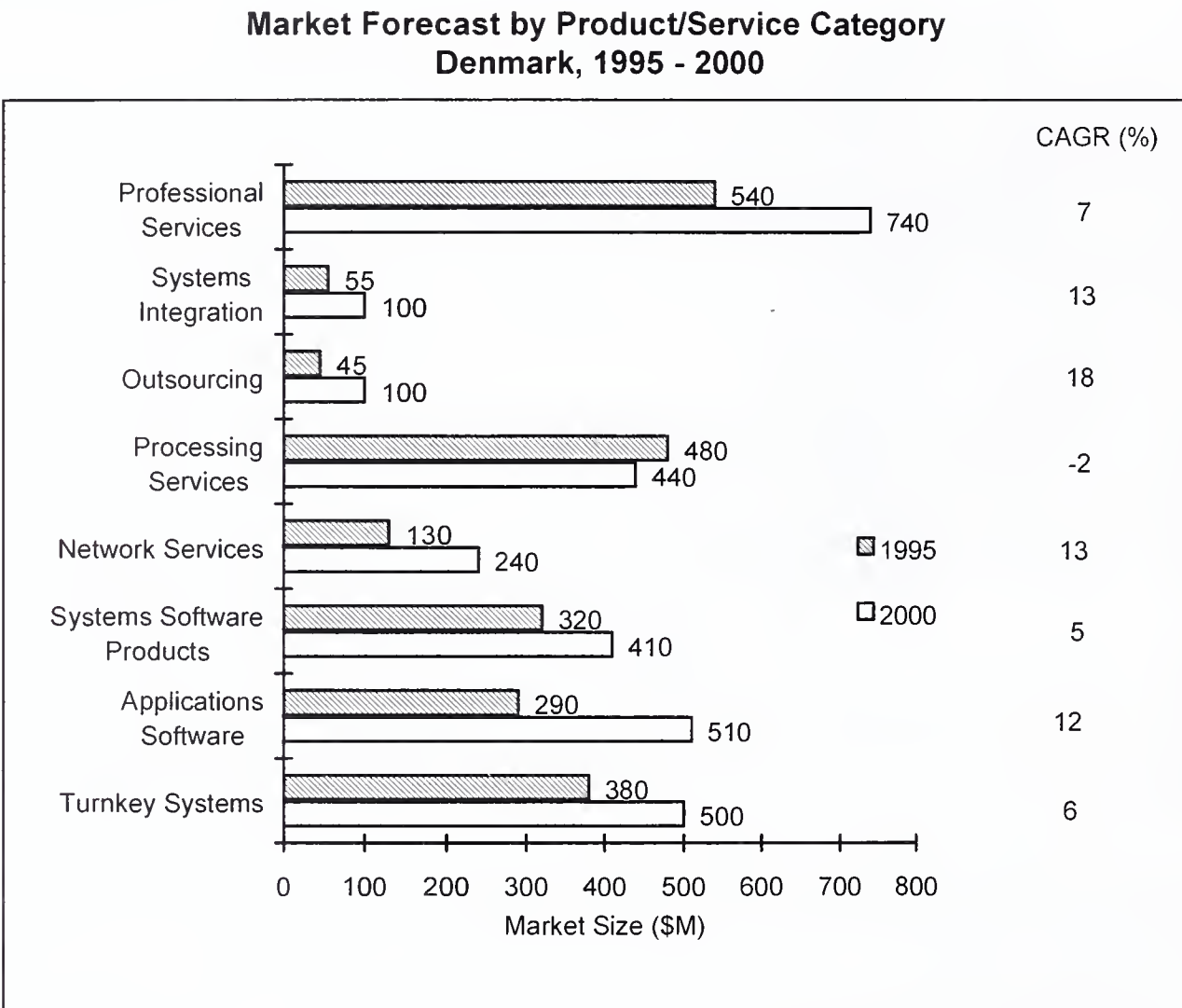
The application software market is growing at above the European average rate (12%) for all Nordic countries over the next five years, with the exception of Denmark. Denmark, which is forecast to grow at 12%, will, however, experience an increasing adoption of standardized software packages, particularly for mid-range systems—this is because open systems based on UNIX are already accepted in the Danish market. Downsizing is not a major issue in Denmark as there are few installations of large systems. Exhibit 3 shows the market sizes and growth rates for the Danish information services market for the product/service categories. A detailed forecast of the components of each product/service category is shown in the section, Forecast Database.

Systems software spending within the Nordic region is also growing at above average European rates in all countries except Finland. However, this element of the software and services market accounted for a relatively low proportion of the Nordic region's revenues in 1994, approximately 10% to 14%—the average across Europe is 16%. Similarly, systems integration accounts for only 2% to 4% of each country's total software and services



revenues compared to an average of 6% for Europe. Within Europe the Nordic region has the lowest level of penetration for systems integration services, primarily due to the lack of major project opportunities at present. INPUT believes that this segment of the market will offer opportunities in the future.

Exhibit 3



Numbers are rounded

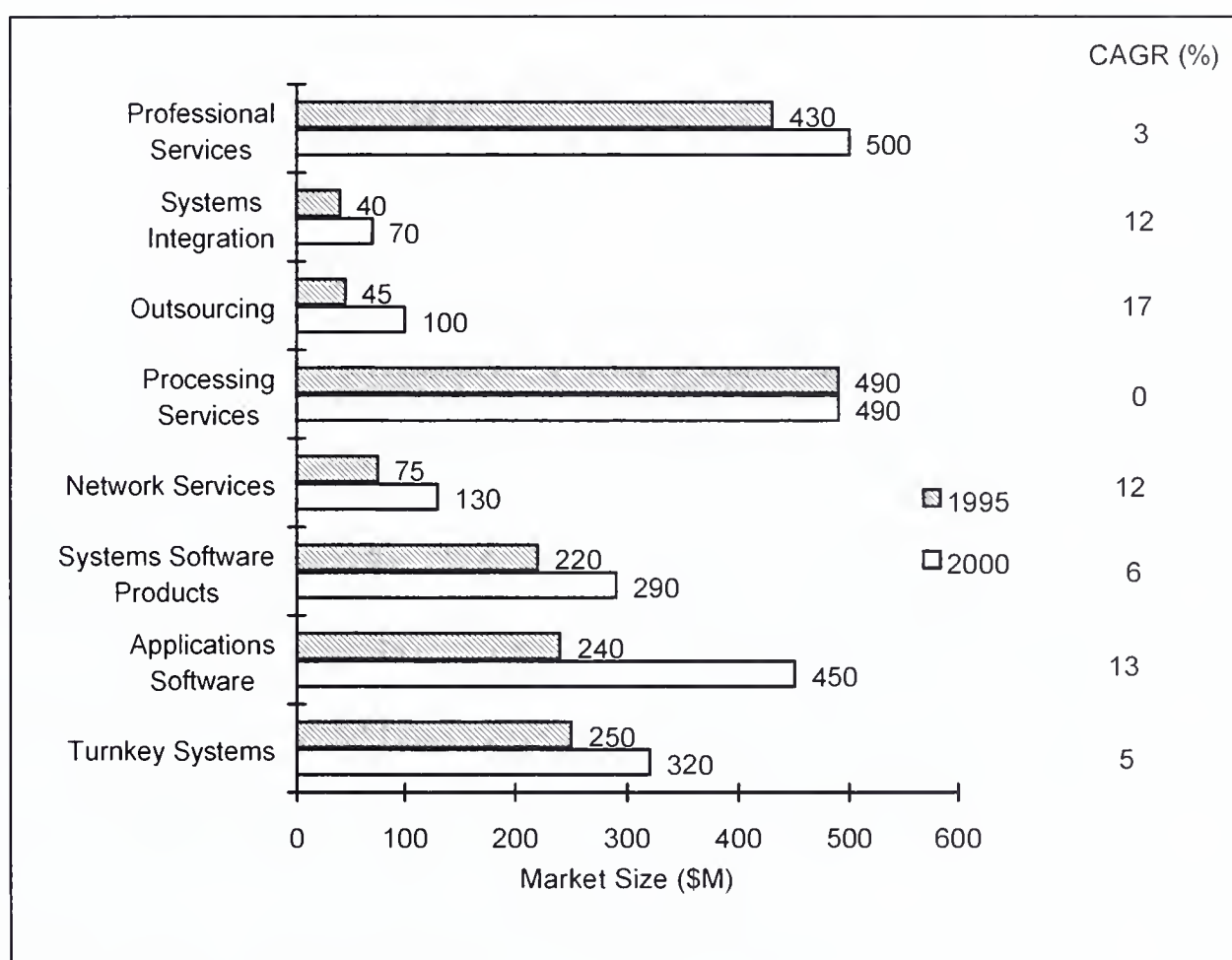
Source: INPUT

By way of contrast, processing services are particularly important in the Norwegian (28% of the total Norwegian market), Danish (23%) and Finnish (15%) markets—these are the top three countries within Europe for these services in terms of market share for the service—but growth is limited. Agriculture and financial services are the sectors where most activity occurs. Within Denmark, for example, the market for processing services will decline 2% over the next five years. Norway’s spending will stay flat over the same time period. The major information services growth opportunities in Norway include outsourcing, systems integration, network services and application software. The growth rates for these segments, along with other Norwegian product/service categories, are

shown in Exhibit 4. A detailed forecast of the components of each product/service category is shown in the section, Forecast Database.

Exhibit 4

**Market Forecast by Product/Service Category  
Norway, 1995 - 2000**



Numbers are rounded

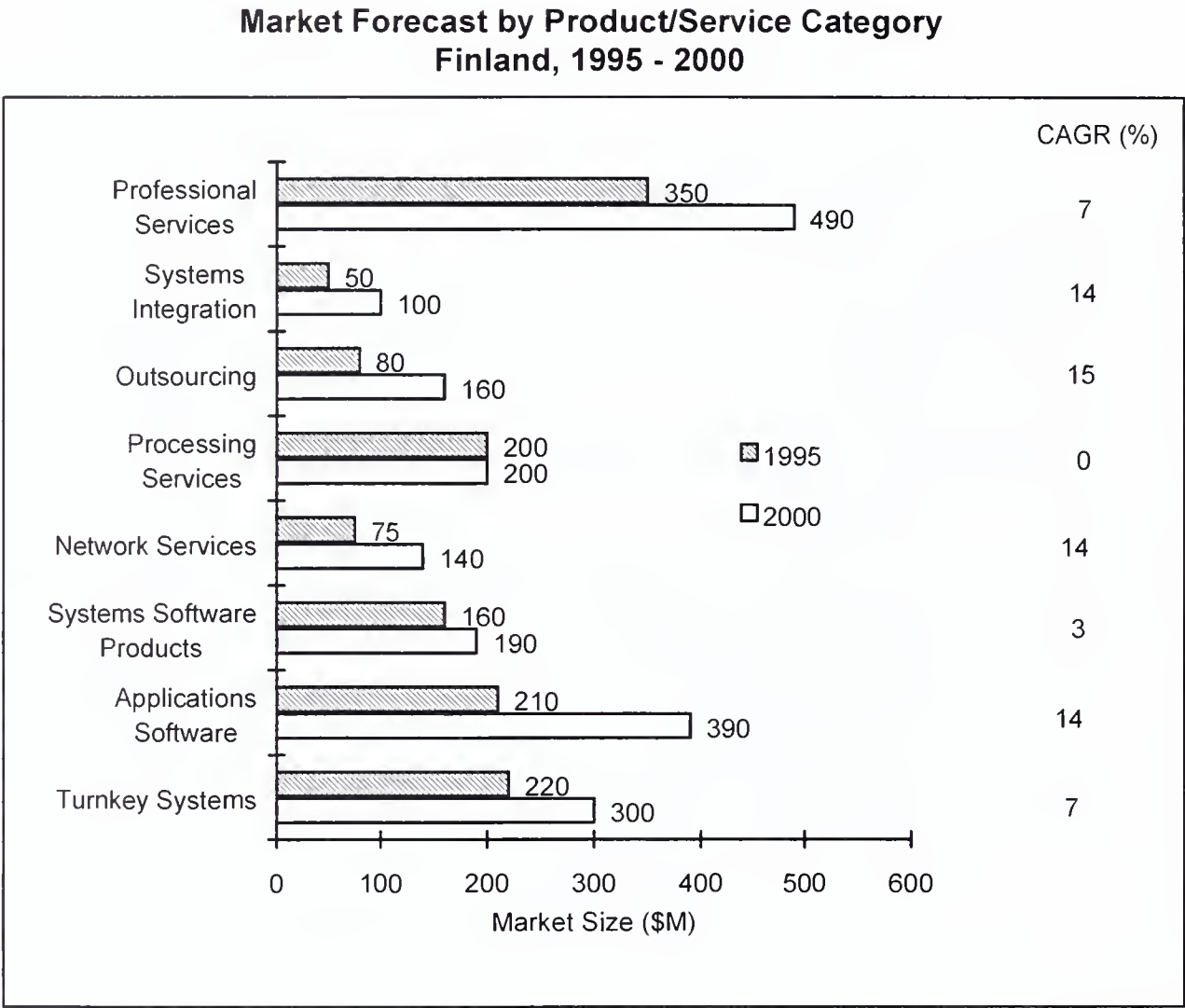
Source: INPUT

Exhibit 5 gives the INPUT information services forecast for Finland. There are similar opportunities to that of Norway for growth up to the year 2000, namely in the areas of outsourcing (15%), systems integration (14%) and network services (14%). A detailed forecast of the components of each delivery mode is shown in Appendix F.

Because of falling software prices, there is an growing separation between companies who develop software and those who market it. Few companies can afford to retain every operation in-house—from production to distribution. This new requirement has led users and vendors to search for cheaper labor sources. Off-shore programming is becoming more common, particularly in Scandinavia, as well as some Baltic and eastern European countries. In Europe this trend is aided by the gradual dismantling of trade barriers within Europe. Even though the market is still in embryonic form it will become a credible

alternative as pan-European data networks emerge and user organizations continue to integrate on an international scale.

Exhibit 5



Numbers are rounded

Source: INPUT

Leading Software and Services Vendors

The following tables (Exhibits 6 through 9) note the leading software and services vendors for each of the Nordic countries. Each table offers a ranking, the vendor’s name and country of origin, and INPUT’s estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.

Exhibit 6

**Leading Software and Services Vendors—Denmark, 1994**

| <b>Ranking</b> | <b>Company Name</b> | <b>Country of Origin</b> | <b>Market Share (%)</b> |
|----------------|---------------------|--------------------------|-------------------------|
| 1              | Kommunedata         | Denmark                  | 11.6                    |
| 2              | IBM                 | United States            | 10.8                    |
| 3              | PBS                 | Denmark                  | 7.2                     |
| 4              | ICL                 | United Kingdom           | 1.8                     |
| 5              | Computer Associates | United States            | 1.7                     |
| 6              | JDC Data            | Denmark                  | 1.6                     |
| 7              | Oracle              | United States            | 1.5                     |
| 8              | Microsoft           | United States            | 1.2                     |
| 9              | DanNet              | Denmark                  | 1.2                     |
| 10             | Digital Equipment   | United States            | 1.1                     |
| 11             | SNI                 | Germany                  | 1.1                     |

Source: INPUT

Exhibit 7

**Leading Software and Services Vendors—Finland, 1994**

| <b>Ranking</b> | <b>Company Name</b>     | <b>Country of Origin</b> | <b>Market Share (%)</b> |
|----------------|-------------------------|--------------------------|-------------------------|
| 1              | Tietotehdas             | Finland                  | 13.2                    |
| 2              | KT - Datacenter         | Finland                  | 11.4                    |
| 3              | IBM                     | United States            | 9.9                     |
| 4              | VTKK                    | Finland                  | 9.1                     |
| 5              | ICL                     | United Kingdom           | 8.1                     |
| 6              | Paakaupunkisedom        | Finland                  | 3.0                     |
| 7              | Digital Equipment Corp. | United States            | 2.9                     |
| 8              | Elorg-Data              | Finland                  | 2.8                     |
| 9              | Computer Associates     | United States            | 2.4                     |
| 10             | CGS                     | France                   | 2.0                     |

Source: INPUT



Exhibit 8

Leading Software and Services Vendors—Norway, 1994

| Ranking | Company Name         | Country of Origin | Market Share (%) |
|---------|----------------------|-------------------|------------------|
| 1       | NIT                  | United States     | 10.6             |
| 2       | IBM                  | United States     | 8.7              |
| 3       | Fellesdata           | Norway            | 5.5              |
| 4       | BBS                  | Norway            | 4.9              |
| 5       | Novit                | Norway            | 3.7              |
| 6       | Rogalandsdata        | Norway            | 2.3              |
| 7=      | Celsius Info. System | Sweden            | 2.1              |
| 7=      | EDB                  | Norway            | 2.1              |
| 9       | Andersen Consulting  | United States     | 1.9              |
| 10      | Computer Associates  | United States     | 1.8              |

Source: INPUT

Exhibit 9

Leading Software and Services Vendors—Sweden, 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | Celsius Info. System    | Sweden            | 14.8             |
| 2       | IBM                     | United States     | 7.3              |
| 3       | WM-Data                 | Sweden            | 6.2              |
| 4       | CGS                     | France            | 5.8              |
| 5       | Sema                    | France            | 5.6              |
| 6       | Sapia                   | Sweden            | 4.5              |
| 7       | SKD Foretagen           | Sweden            | 3.0              |
| 8       | EDS                     | United States     | 2.4              |
| 9       | ICL                     | United Kingdom    | 2.1              |
| 10      | Digital Equipment Corp. | United States     | 1.9              |

Source: INPUT

IT Spending

The four tables in this section (Exhibits 10 through 13) offer INPUT's estimate of IT spending for the four Nordic countries. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy costs) and information services spending. Both dollar amounts (in US\$ billions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” sub-categories of their respective information services product/service category and identified for each Nordic country in the following section, Forecast Database.

Exhibit 10

**1995 IT Spending—Denmark**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 540   | 7                             |
| Internal Staff           | 2,050                                       | 29                            |
| Equipment                | 1,250                                       | 18                            |
| Equipment Services       | 510   | 7                             |
| Facilities               | 530   | 7                             |
| Information Services     | 2,250                                       | 31                            |
| <b>Total IT Spending</b> | <b>7,130</b>                                | <b>100</b>                    |

Numbers are rounded

Source: INPUT

Exhibit 11

**1995 IT Spending—Finland**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 490   | 9                             |
| Internal Staff           | 1,350                                       | 26                            |
| Equipment                | 1,150                                       | 23                            |
| Equipment Services       | 340   | 7                             |
| Facilities               | 460   | 9                             |
| Information Services     | 1,350                                       | 26                            |
| <b>Total IT Spending</b> | <b>5,140</b>                                | <b>100</b>                    |

Numbers are rounded

Source: INPUT

Exhibit 12

1995 IT Spending—Norway

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 450                                 | 9                      |
| Internal Staff           | 1,250                               | 24                     |
| Equipment                | 900                                 | 17                     |
| Equipment Services       | 430                                 | 8                      |
| Facilities               | 440                                 | 8                      |
| Information Services     | 1,800                               | 34                     |
| <b>Total IT Spending</b> | <b>5,270</b>                        | <b>100</b>             |

Numbers are rounded

Source: INPUT

Exhibit 13

1995 IT Spending—Sweden

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 780                                 | 8                      |
| Internal Staff           | 2,150                               | 23                     |
| Equipment                | 1,350                               | 14                     |
| Equipment Services       | 810                                 | 9                      |
| Facilities               | 810                                 | 9                      |
| Information Services     | 3,450                               | 37                     |
| <b>Total IT Spending</b> | <b>9,350</b>                        | <b>100</b>             |

Numbers are rounded

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database for each country, for the period 1995-2000.

Exhibit 14

## Information Services Market Denmark, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 2105       | 6%               | 2235       | 2420       | 2580       | 2730       | 2895       | 3045       | 6%             |
| <b>Professional Services</b>    | 500        | 7%               | 535        | 565        | 610        | 650        | 690        | 740        | 7%             |
| - IS Consulting                 | 94         | 11%              | 104        | 115        | 129        | 143        | 160        | 176        | 11%            |
| - Education & Training          | 45         | 5%               | 47         | 50         | 53         | 55         | 58         | 61         | 5%             |
| - Software Development          | 360        | 5%               | 380        | 395        | 420        | 445        | 470        | 495        | 5%             |
| - Application Management        | 4          | 20%              | 5          | 5          | 6          | 7          | 9          | 12         | 18%            |
| <b>Systems Integration</b>      | 50         | 8%               | 55         | 60         | 69         | 78         | 90         | 101        | 13%            |
| - Equipment                     | 12         | 4%               | 12         | 13         | 14         | 14         | 15         | 17         | 7%             |
| - Applications Software         | 8          | 14%              | 9          | 10         | 13         | 18         | 23         | 28         | 25%            |
| - Systems Software              | 4          | 8%               | 4          | 5          | 5          | 5          | 6          | 7          | 11%            |
| - Professional Services         | 24         | 6%               | 25         | 29         | 33         | 37         | 43         | 44         | 12%            |
| - Other                         | 3          | 28%              | 4          | 4          | 4          | 4          | 3          | 4          | 1%             |
| <b>Outsourcing</b>              | 38         | 17%              | 45         | 53         | 63         | 74         | 86         | 101        | 18%            |
| - Platform Operations           | 10         | 17%              | 12         | 13         | 15         | 17         | 18         | 21         | 12%            |
| - Applications Operations       | 18         | 14%              | 21         | 24         | 27         | 32         | 38         | 44         | 16%            |
| - Desktop Services              | 9          | 27%              | 12         | 16         | 20         | 25         | 30         | 36         | 26%            |
| <b>Processing Services</b>      | 487        | -1%              | 484        | 479        | 474        | 466        | 456        | 443        | -2%            |
| - Transaction Processing        | 444        | -1%              | 439        | 434        | 428        | 420        | 408        | 395        | -2%            |
| - Utility Processing            | 9          | -2%              | 9          | 9          | 8          | 8          | 8          | 7          | -3%            |
| - Other Processing              | 34         | 6%               | 36         | 36         | 38         | 39         | 40         | 41         | 3%             |
| <b>Network Services</b>         | 110        | 13%              | 125        | 145        | 166        | 189        | 211        | 235        | 13%            |
| - Electronic Information Svcs   | 64         | 8%               | 69         | 78         | 86         | 92         | 99         | 104        | 8%             |
| - Network Applications          | 43         | 19%              | 51         | 63         | 76         | 91         | 106        | 124        | 19%            |
| - Network Management            | 4          | 9%               | 4          | 5          | 5          | 6          | 7          | 8          | 15%            |
| <b>Applications SW Products</b> | 265        | 9%               | 290        | 360        | 405        | 435        | 475        | 510        | 12%            |
| - Mainframe                     | 15         | -5%              | 14         | 14         | 14         | 13         | 13         | 12         | -3%            |
| - Minicomputer                  | 78         | 5%               | 82         | 89         | 97         | 105        | 111        | 117        | 7%             |
| - Workstation/PC                | 170        | 15%              | 190        | 260        | 295        | 315        | 355        | 380        | 14%            |
| <b>Systems SW Products</b>      | 295        | 8%               | 320        | 355        | 370        | 385        | 405        | 410        | 5%             |
| - Mainframe                     | 112        | 1%               | 114        | 112        | 112        | 110        | 109        | 106        | -1%            |
| - Minicomputer                  | 104        | 8%               | 112        | 120        | 129        | 137        | 142        | 147        | 6%             |
| - Workstation/PC                | 79         | 21%              | 96         | 121        | 131        | 139        | 155        | 162        | 11%            |
| <b>Turnkey Systems</b>          | 357        | 6%               | 380        | 405        | 433        | 459        | 481        | 499        | 6%             |
| - Equipment                     | 165        | 3%               | 170        | 174        | 179        | 182        | 183        | 182        | 1%             |
| - Applications Software         | 69         | 10%              | 76         | 83         | 92         | 100        | 107        | 114        | 8%             |
| - Systems Software              | 22         | 6%               | 24         | 25         | 26         | 28         | 29         | 29         | 4%             |
| - Professional Services         | 101        | 11%              | 112        | 124        | 137        | 150        | 163        | 175        | 9%             |



Exhibit 15

## Information Services Market Finland, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 1280       | 5%               | 1340       | 1460       | 1560       | 1665       | 1810       | 1960       | 8%             |
| <b>Professional Services</b>    | 340        | 2%               | 350        | 365        | 385        | 410        | 445        | 485        | 7%             |
| - IS Consulting                 | 60         | 5%               | 64         | 69         | 75         | 84         | 94         | 106        | 11%            |
| - Education & Training          | 32         | 1%               | 32         | 33         | 34         | 36         | 38         | 40         | 5%             |
| - Software Development          | 250        | 1%               | 250        | 260        | 270        | 290        | 310        | 340        | 6%             |
| - Application Management        | 2          | 14%              | 2          | 2          | 2          | 3          | 3          | 4          | 20%            |
| <b>Systems Integration</b>      | 45         | 14%              | 51         | 58         | 67         | 76         | 86         | 98         | 14%            |
| - Equipment                     | 10         | 10%              | 11         | 12         | 13         | 14         | 15         | 17         | 8%             |
| - Applications Software         | 6          | 31%              | 8          | 10         | 13         | 18         | 21         | 25         | 26%            |
| - Systems Software              | 4          | 12%              | 4          | 5          | 5          | 5          | 5          | 6          | 8%             |
| - Professional Services         | 21         | 14%              | 24         | 28         | 32         | 35         | 41         | 44         | 13%            |
| - Other                         | 4          | 0%               | 4          | 4          | 4          | 5          | 5          | 6          | 10%            |
| <b>Outsourcing</b>              | 68         | 17%              | 79         | 91         | 105        | 122        | 141        | 162        | 15%            |
| - Platform Operations           | 23         | 15%              | 27         | 31         | 35         | 39         | 43         | 48         | 12%            |
| - Applications Operations       | 39         | 15%              | 45         | 52         | 59         | 70         | 81         | 95         | 16%            |
| - Desktop Services              | 5          | 32%              | 7          | 8          | 11         | 13         | 15         | 19         | 22%            |
| <b>Processing Services</b>      | 201        | 0%               | 201        | 201        | 201        | 202        | 200        | 200        | 0%             |
| - Transaction Processing        | 180        | -1%              | 179        | 179        | 177        | 177        | 175        | 174        | 0%             |
| - Utility Processing            | 6          | -4%              | 5          | 5          | 5          | 4          | 4          | 4          | -6%            |
| - Other Processing              | 16         | 4%               | 17         | 18         | 19         | 20         | 21         | 21         | 5%             |
| <b>Network Services</b>         | 66         | 13%              | 74         | 85         | 95         | 108        | 123        | 142        | 14%            |
| - Electronic Information Svcs   | 35         | 9%               | 38         | 42         | 47         | 51         | 55         | 60         | 10%            |
| - Network Applications          | 22         | 19%              | 27         | 32         | 38         | 46         | 54         | 65         | 20%            |
| - Network Management            | 8          | 11%              | 9          | 10         | 11         | 12         | 14         | 17         | 14%            |
| <b>Applications SW Products</b> | 185        | 10%              | 205        | 255        | 285        | 310        | 350        | 385        | 14%            |
| - Mainframe                     | 13         | -8%              | 12         | 11         | 11         | 11         | 10         | 10         | -4%            |
| - Minicomputer                  | 54         | 8%               | 58         | 65         | 72         | 79         | 89         | 98         | 11%            |
| - Workstation/PC                | 115        | 14%              | 130        | 180        | 205        | 220        | 250        | 275        | 16%            |
| <b>Systems SW Products</b>      | 165        | -3%              | 160        | 170        | 170        | 175        | 180        | 185        | 3%             |
| - Mainframe                     | 61         | -14%             | 53         | 48         | 43         | 40         | 37         | 35         | -8%            |
| - Minicomputer                  | 57         | 0%               | 57         | 58         | 60         | 64         | 68         | 72         | 5%             |
| - Workstation/PC                | 48         | 11%              | 53         | 62         | 65         | 69         | 74         | 79         | 8%             |
| <b>Turnkey Systems</b>          | 211        | 5%               | 222        | 237        | 253        | 268        | 287        | 304        | 7%             |
| - Equipment                     | 97         | 2%               | 99         | 104        | 107        | 110        | 113        | 116        | 3%             |
| - Applications Software         | 42         | 10%              | 47         | 51         | 56         | 61         | 68         | 74         | 10%            |
| - Systems Software              | 13         | 5%               | 14         | 15         | 15         | 16         | 17         | 18         | 6%             |
| - Professional Services         | 58         | 7%               | 62         | 69         | 75         | 81         | 89         | 96         | 9%             |

Exhibit 16

## Information Services Market Norway, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 1730       | 3%               | 1790       | 1910       | 1995       | 2100       | 2235       | 2350       | 6%             |
| <b>Professional Services</b>    | 430        | 0%               | 430        | 435        | 450        | 475        | 490        | 505        | 3%             |
| - IS Consulting                 | 66         | 4%               | 69         | 73         | 79         | 85         | 91         | 98         | 7%             |
| - Education & Training          | 53         | 3%               | 54         | 56         | 59         | 62         | 65         | 69         | 5%             |
| - Software Development          | 305        | 0%               | 305        | 305        | 310        | 320        | 325        | 325        | 1%             |
| - Application Management        | 4          | 12%              | 4          | 4          | 5          | 6          | 8          | 10         | 20%            |
| <b>Systems Integration</b>      | 37         | 10%              | 41         | 46         | 52         | 58         | 64         | 72         | 12%            |
| - Equipment                     | 10         | 0%               | 10         | 10         | 10         | 10         | 10         | 11         | 3%             |
| - Applications Software         | 5          | 26%              | 7          | 8          | 10         | 13         | 15         | 18         | 22%            |
| - Systems Software              | 3          | 10%              | 3          | 4          | 4          | 5          | 4          | 5          | 9%             |
| - Professional Services         | 17         | 12%              | 19         | 21         | 25         | 27         | 31         | 35         | 13%            |
| - Other                         | 3          | -5%              | 3          | 3          | 3          | 4          | 3          | 4          | 5%             |
| <b>Outsourcing</b>              | 39         | 19%              | 47         | 55         | 65         | 75         | 88         | 102        | 17%            |
| - Platform Operations           | 14         | 17%              | 16         | 18         | 20         | 22         | 25         | 28         | 12%            |
| - Applications Operations       | 19         | 16%              | 22         | 25         | 28         | 33         | 39         | 45         | 16%            |
| - Desktop Services              | 7          | 30%              | 10         | 13         | 16         | 20         | 24         | 30         | 25%            |
| <b>Processing Services</b>      | 494        | 0%               | 494        | 490        | 491        | 491        | 493        | 494        | 0%             |
| - Transaction Processing        | 451        | 0%               | 451        | 447        | 447        | 447        | 447        | 447        | 0%             |
| - Utility Processing            | 9          | -3%              | 9          | 9          | 8          | 8          | 8          | 8          | -3%            |
| - Other Processing              | 34         | 2%               | 34         | 35         | 36         | 37         | 39         | 39         | 3%             |
| <b>Network Services</b>         | 68         | 7%               | 73         | 79         | 89         | 101        | 113        | 127        | 12%            |
| - Electronic Information Svcs   | 41         | 2%               | 42         | 43         | 47         | 51         | 54         | 57         | 7%             |
| - Network Applications          | 23         | 13%              | 26         | 31         | 36         | 44         | 51         | 61         | 19%            |
| - Network Management            | 5          | 10%              | 5          | 6          | 6          | 7          | 8          | 10         | 15%            |
| <b>Applications SW Products</b> | 215        | 11%              | 240        | 300        | 335        | 360        | 410        | 445        | 13%            |
| - Mainframe                     | 16         | -5%              | 15         | 15         | 15         | 15         | 14         | 14         | -1%            |
| - Minicomputer                  | 61         | 6%               | 65         | 70         | 76         | 82         | 88         | 96         | 8%             |
| - Workstation/PC                | 140        | 16%              | 160        | 215        | 245        | 265        | 305        | 335        | 16%            |
| <b>Systems SW Products</b>      | 210        | 4%               | 215        | 235        | 245        | 255        | 275        | 285        | 6%             |
| - Mainframe                     | 87         | -4%              | 83         | 82         | 81         | 80         | 79         | 79         | -1%            |
| - Minicomputer                  | 69         | 4%               | 72         | 76         | 82         | 88         | 93         | 100        | 7%             |
| - Workstation/PC                | 53         | 15%              | 61         | 77         | 83         | 90         | 101        | 109        | 12%            |
| <b>Turnkey Systems</b>          | 243        | 4%               | 252        | 261        | 269        | 286        | 304        | 317        | 5%             |
| - Equipment                     | 121        | 2%               | 123        | 125        | 127        | 132        | 137        | 140        | 3%             |
| - Applications Software         | 48         | 9%               | 53         | 57         | 62         | 69         | 76         | 83         | 10%            |
| - Systems Software              | 15         | 0%               | 15         | 16         | 16         | 16         | 17         | 17         | 3%             |
| - Professional Services         | 59         | 4%               | 61         | 63         | 65         | 69         | 73         | 76         | 5%             |

Exhibit 17

## Information Services Market Sweden, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 3215       | 7%               | 3445       | 3795       | 4160       | 4565       | 5035       | 5480       | 10%            |
| <b>Professional Services</b>    | 1360       | 4%               | 1415       | 1505       | 1630       | 1790       | 1950       | 2085       | 8%             |
| - IS Consulting                 | 150        | 6%               | 159        | 174        | 193        | 216        | 240        | 261        | 10%            |
| - Education & Training          | 92         | 5%               | 96         | 102        | 110        | 118        | 126        | 135        | 7%             |
| - Software Development          | 1105       | 3%               | 1135       | 1205       | 1300       | 1420       | 1535       | 1630       | 7%             |
| - Application Management        | 20         | 10%              | 22         | 25         | 30         | 38         | 47         | 55         | 21%            |
| <b>Systems Integration</b>      | 50         | 8%               | 54         | 61         | 68         | 74         | 84         | 90         | 11%            |
| - Equipment                     | 13         | 3%               | 13         | 13         | 13         | 14         | 14         | 15         | 2%             |
| - Applications Software         | 7          | 23%              | 9          | 10         | 13         | 16         | 20         | 24         | 22%            |
| - Systems Software              | 4          | 7%               | 4          | 5          | 5          | 5          | 6          | 6          | 8%             |
| - Professional Services         | 23         | 8%               | 24         | 28         | 32         | 36         | 40         | 42         | 11%            |
| - Other                         | 4          | -7%              | 4          | 4          | 4          | 4          | 4          | 5          | 4%             |
| <b>Outsourcing</b>              | 288        | 22%              | 353        | 429        | 516        | 611        | 720        | 835        | 19%            |
| - Platform Operations           | 68         | 18%              | 80         | 94         | 111        | 127        | 142        | 162        | 15%            |
| - Applications Operations       | 168        | 20%              | 202        | 243        | 286        | 337        | 397        | 458        | 18%            |
| - Desktop Services              | 53         | 36%              | 71         | 92         | 120        | 148        | 182        | 215        | 25%            |
| <b>Processing Services</b>      | 384        | 0%               | 384        | 382        | 383        | 385        | 387        | 391        | 0%             |
| - Transaction Processing        | 346        | 0%               | 345        | 342        | 342        | 342        | 342        | 343        | 0%             |
| - Utility Processing            | 8          | -1%              | 7          | 7          | 7          | 7          | 7          | 7          | -1%            |
| - Other Processing              | 31         | 4%               | 32         | 33         | 35         | 37         | 39         | 41         | 5%             |
| <b>Network Services</b>         | 144        | 12%              | 162        | 189        | 221        | 259        | 302        | 353        | 17%            |
| - Electronic Information Svcs   | 74         | 8%               | 80         | 90         | 101        | 113        | 124        | 136        | 11%            |
| - Network Applications          | 50         | 19%              | 59         | 74         | 92         | 113        | 139        | 168        | 23%            |
| - Network Management            | 20         | 10%              | 22         | 24         | 29         | 33         | 39         | 49         | 17%            |
| <b>Applications SW Products</b> | 335        | 15%              | 385        | 490        | 560        | 605        | 690        | 755        | 14%            |
| - Mainframe                     | 24         | -3%              | 23         | 22         | 22         | 21         | 20         | 20         | -3%            |
| - Minicomputer                  | 86         | 9%               | 94         | 103        | 112        | 122        | 133        | 146        | 9%             |
| - Workstation/PC                | 225        | 19%              | 270        | 365        | 425        | 460        | 535        | 590        | 17%            |
| <b>Systems SW Products</b>      | 310        | 2%               | 320        | 345        | 355        | 365        | 390        | 400        | 5%             |
| - Mainframe                     | 147        | -5%              | 140        | 136        | 132        | 128        | 124        | 120        | -3%            |
| - Minicomputer                  | 87         | 4%               | 90         | 96         | 102        | 108        | 115        | 121        | 6%             |
| - Workstation/PC                | 77         | 14%              | 88         | 115        | 123        | 132        | 150        | 162        | 13%            |
| <b>Turnkey Systems</b>          | 350        | 6%               | 370        | 397        | 424        | 471        | 518        | 566        | 9%             |
| - Equipment                     | 158        | 2%               | 160        | 166        | 173        | 183        | 194        | 202        | 5%             |
| - Applications Software         | 74         | 10%              | 82         | 91         | 102        | 116        | 133        | 149        | 13%            |
| - Systems Software              | 22         | 3%               | 22         | 23         | 24         | 25         | 26         | 28         | 4%             |
| - Professional Services         | 94         | 14%              | 108        | 115        | 128        | 148        | 168        | 189        | 12%            |





# Worldwide Information Services Program

## Information Services Market Forecast Europe, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>REGIONAL TOTAL</b>           | 83,460     | 7%           | 89,100     | 97,610     | 105,270    | 113,080    | 123,280    | 133,350    | 8%         |
| <b>Professional Services</b>    | 23,290     | 3%           | 23,930     | 24,660     | 25,610     | 26,510     | 27,630     | 28,860     | 4%         |
| - IS Consulting                 | 3,590      | 10%          | 3,940      | 4,290      | 4,700      | 5,160      | 5,700      | 6,270      | 10%        |
| - Education & Training          | 2,650      | 6%           | 2,820      | 3,010      | 3,210      | 3,420      | 3,650      | 3,870      | 7%         |
| - Software Development          | 16,760     | 0%           | 16,780     | 16,930     | 17,330     | 17,440     | 17,700     | 17,810     | 1%         |
| - Application Management        | 230        | 26%          | 290        | 360        | 460        | 570        | 710        | 850        | 24%        |
| <b>Systems Integration</b>      | 4,710      | 12%          | 5,260      | 5,900      | 6,710      | 7,550      | 8,490      | 9,600      | 13%        |
| - Equipment                     | 1,190      | 6%           | 1,260      | 1,260      | 1,300      | 1,370      | 1,420      | 1,560      | 4%         |
| - Applications Software         | 830        | 19%          | 990        | 1,190      | 1,490      | 1,800      | 2,220      | 2,640      | 22%        |
| - Systems Software              | 350        | 11%          | 390        | 430        | 480        | 530        | 590        | 670        | 11%        |
| - Professional Services         | 2,150      | 12%          | 2,400      | 2,780      | 3,140      | 3,480      | 3,860      | 4,260      | 12%        |
| - Other                         | 200        | 10%          | 220        | 260        | 290        | 370        | 380        | 460        | 16%        |
| <b>Outsourcing</b>              | 3,620      | 26%          | 4,570      | 5,670      | 6,880      | 8,200      | 9,640      | 11,180     | 20%        |
| - Platform Operations           | 1,030      | 14%          | 1,170      | 1,350      | 1,490      | 1,690      | 1,860      | 2,010      | 11%        |
| - Applications Operations       | 2,080      | 31%          | 2,730      | 3,450      | 4,250      | 5,100      | 6,040      | 6,990      | 21%        |
| - Desktop Services              | 490        | 33%          | 650        | 860        | 1,110      | 1,410      | 1,750      | 2,160      | 27%        |
| <b>Processing Services</b>      | 8,290      | 3%           | 8,560      | 8,800      | 9,130      | 9,510      | 9,840      | 10,300     | 4%         |
| - Transaction Processing        | 7,090      | 2%           | 7,240      | 7,390      | 7,600      | 7,840      | 8,060      | 8,320      | 3%         |
| - Utility Processing            | 270        | 0%           | 270        | 270        | 270        | 270        | 270        | 280        | 1%         |
| - Other Processing              | 950        | 8%           | 1,030      | 1,140      | 1,260      | 1,390      | 1,540      | 1,690      | 10%        |
| <b>Network Services</b>         | 6,110      | 13%          | 6,890      | 7,930      | 9,210      | 10,710     | 12,580     | 14,780     | 16%        |
| - Electronic Information Svcs   | 3,740      | 9%           | 4,090      | 4,520      | 4,960      | 5,380      | 5,850      | 6,270      | 9%         |
| - Network Applications          | 1,800      | 21%          | 2,180      | 2,720      | 3,460      | 4,410      | 5,630      | 7,180      | 27%        |
| - Network Management            | 560        | 11%          | 620        | 700        | 800        | 920        | 1,080      | 1,310      | 16%        |
| <b>Applications SW Products</b> | 11,100     | 10%          | 12,230     | 15,010     | 16,680     | 17,830     | 20,130     | 21,730     | 12%        |
| - Mainframe                     | 860        | -7%          | 800        | 770        | 720        | 690        | 670        | 630        | -5%        |
| - Minicomputer                  | 3,080      | 6%           | 3,250      | 3,460      | 3,750      | 4,110      | 4,450      | 4,830      | 8%         |
| - Workstation/PC                | 7,120      | 15%          | 8,190      | 10,870     | 12,300     | 12,990     | 14,930     | 16,180     | 15%        |
| <b>Systems SW Products</b>      | 13,450     | 5%           | 14,130     | 15,340     | 15,700     | 16,170     | 16,960     | 17,440     | 4%         |
| - Mainframe                     | 5,550      | -4%          | 5,310      | 5,090      | 4,820      | 4,500      | 4,210      | 3,840      | -6%        |
| - Minicomputer                  | 4,270      | 5%           | 4,480      | 4,720      | 4,940      | 5,210      | 5,470      | 5,750      | 5%         |
| - Workstation/PC                | 3,590      | 21%          | 4,330      | 5,470      | 5,920      | 6,420      | 7,250      | 7,890      | 13%        |
| <b>Turnkey Systems</b>          | 12,890     | 5%           | 13,530     | 14,300     | 15,350     | 16,600     | 18,010     | 19,460     | 8%         |
| - Equipment                     | 6,260      | 2%           | 6,410      | 6,620      | 6,870      | 7,160      | 7,480      | 7,760      | 4%         |
| - Applications Software         | 2,580      | 10%          | 2,840      | 3,050      | 3,420      | 3,840      | 4,350      | 4,870      | 11%        |
| - Systems Software              | 730        | 3%           | 750        | 800        | 840        | 900        | 950        | 1,000      | 6%         |
| - Professional Services         | 3,310      | 8%           | 3,560      | 3,850      | 4,230      | 4,690      | 5,240      | 5,790      | 10%        |

Note: Numbers are rounded











## Information Services Market Forecast Austria, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 1,515      | 9%           | 1,650      | 1,835      | 1,970      | 2,110      | 2,250      | 2,340      | 7%         |
| <b>Professional Services</b>    | 335        | 5%           | 355        | 365        | 385        | 395        | 405        | 415        | 3%         |
| - IS Consulting                 | 48         | 10%          | 53         | 58         | 64         | 68         | 73         | 77         | 8%         |
| - Education & Training          | 40         | 4%           | 41         | 43         | 45         | 46         | 47         | 49         | 3%         |
| - Software Development          | 250        | 2%           | 255        | 265        | 275        | 280        | 280        | 280        | 2%         |
| - Application Management        | 2          | 10%          | 2          | 2          | 3          | 3          | 4          | 5          | 21%        |
| <b>Systems Integration</b>      | 51         | 15%          | 58         | 64         | 73         | 82         | 93         | 106        | 13%        |
| - Equipment                     | 13         | 8%           | 14         | 15         | 16         | 17         | 18         | 18         | 5%         |
| - Applications Software         | 11         | 16%          | 13         | 14         | 17         | 19         | 23         | 30         | 18%        |
| - Systems Software              | 4          | 16%          | 5          | 6          | 6          | 6          | 7          | 7          | 10%        |
| - Professional Services         | 21         | 16%          | 25         | 28         | 32         | 35         | 42         | 47         | 14%        |
| - Other                         | 1          | 25%          | 1          | 2          | 2          | 5          | 3          | 4          | 25%        |
| <b>Outsourcing</b>              | 20         | 19%          | 23         | 28         | 34         | 41         | 48         | 56         | 20%        |
| - Platform Operations           | 4          | 16%          | 5          | 6          | 6          | 7          | 8          | 9          | 12%        |
| - Applications Operations       | 11         | 21%          | 14         | 16         | 21         | 24         | 28         | 31         | 19%        |
| - Desktop Services              | 4          | 22%          | 5          | 6          | 7          | 10         | 12         | 17         | 27%        |
| <b>Processing Services</b>      | 175        | 2%           | 178        | 179        | 183        | 186        | 190        | 191        | 1%         |
| - Transaction Processing        | 154        | 1%           | 155        | 156        | 159        | 162        | 164        | 164        | 1%         |
| - Utility Processing            | 6          | -3%          | 6          | 6          | 6          | 6          | 6          | 5          | -3%        |
| - Other Processing              | 16         | 6%           | 17         | 17         | 19         | 20         | 20         | 21         | 5%         |
| <b>Network Services</b>         | 81         | 11%          | 90         | 102        | 116        | 131        | 150        | 170        | 14%        |
| - Electronic Information Svcs   | 62         | 9%           | 68         | 75         | 83         | 91         | 100        | 109        | 10%        |
| - Network Applications          | 14         | 23%          | 18         | 22         | 28         | 34         | 42         | 52         | 24%        |
| - Network Management            | 4          | 11%          | 5          | 5          | 6          | 7          | 8          | 9          | 14%        |
| <b>Applications SW Products</b> | 200        | 14%          | 230        | 290        | 325        | 350        | 395        | 415        | 12%        |
| - Mainframe                     | 15         | 0%           | 15         | 15         | 15         | 15         | 15         | 14         | -1%        |
| - Minicomputer                  | 59         | 9%           | 64         | 71         | 78         | 86         | 94         | 98         | 9%         |
| - Workstation/PC                | 130        | 17%          | 150        | 205        | 230        | 250        | 285        | 300        | 15%        |
| <b>Systems SW Products</b>      | 280        | 8%           | 305        | 335        | 355        | 370        | 395        | 400        | 6%         |
| - Mainframe                     | 114        | -1%          | 113        | 111        | 110        | 109        | 108        | 101        | -2%        |
| - Minicomputer                  | 95         | 9%           | 103        | 112        | 122        | 133        | 144        | 150        | 8%         |
| - Workstation/PC                | 74         | 19%          | 88         | 111        | 120        | 130        | 145        | 150        | 11%        |
| <b>Turnkey Systems</b>          | 375        | 10%          | 411        | 452        | 492        | 535        | 586        | 612        | 8%         |
| - Equipment                     | 179        | 8%           | 193        | 208        | 221        | 236        | 253        | 258        | 6%         |
| - Applications Software         | 79         | 16%          | 91         | 105        | 121        | 139        | 159        | 175        | 14%        |
| - Systems Software              | 22         | 8%           | 24         | 26         | 28         | 29         | 31         | 32         | 6%         |
| - Professional Services         | 96         | 9%           | 104        | 113        | 122        | 131        | 142        | 147        | 7%         |

Note: Numbers are rounded







## Information Services Market Forecast Belgium, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 2,800      | 7%           | 2,985      | 3,270      | 3,520      | 3,740      | 4,025      | 4,245      | 7%         |
| <b>Professional Services</b>    | 925        | 2%           | 945        | 975        | 1,000      | 1,035      | 1,070      | 1,100      | 3%         |
| - IS Consulting                 | 157        | 9%           | 171        | 189        | 207        | 228        | 252        | 274        | 10%        |
| - Education & Training          | 76         | 2%           | 78         | 80         | 83         | 85         | 88         | 92         | 3%         |
| - Software Development          | 690        | 0%           | 690        | 700        | 705        | 715        | 725        | 725        | 1%         |
| - Application Management        | 3          | 15%          | 4          | 4          | 6          | 7          | 9          | 12         | 26%        |
| <b>Systems Integration</b>      | 132        | 12%          | 148        | 164        | 186        | 209        | 244        | 282        | 14%        |
| - Equipment                     | 31         | 12%          | 34         | 38         | 41         | 44         | 46         | 48         | 7%         |
| - Applications Software         | 29         | 12%          | 33         | 36         | 43         | 48         | 61         | 79         | 19%        |
| - Systems Software              | 11         | 26%          | 13         | 14         | 15         | 15         | 19         | 20         | 8%         |
| - Professional Services         | 54         | 15%          | 62         | 71         | 82         | 90         | 110        | 124        | 15%        |
| - Other                         | 8          | -25%         | 6          | 6          | 6          | 13         | 7          | 11         | 14%        |
| <b>Outsourcing</b>              | 101        | 16%          | 117        | 135        | 159        | 188        | 222        | 265        | 18%        |
| - Platform Operations           | 32         | 15%          | 36         | 41         | 47         | 52         | 58         | 65         | 12%        |
| - Applications Operations       | 63         | 15%          | 73         | 84         | 98         | 118        | 142        | 173        | 19%        |
| - Desktop Services              | 6          | 37%          | 8          | 11         | 14         | 18         | 22         | 28         | 28%        |
| <b>Processing Services</b>      | 241        | -2%          | 235        | 233        | 235        | 234        | 236        | 231        | 0%         |
| - Transaction Processing        | 213        | -3%          | 206        | 203        | 203        | 202        | 202        | 195        | -1%        |
| - Utility Processing            | 7          | -3%          | 6          | 6          | 6          | 6          | 6          | 6          | -2%        |
| - Other Processing              | 22         | 4%           | 23         | 24         | 26         | 27         | 29         | 30         | 6%         |
| <b>Network Services</b>         | 170        | 11%          | 189        | 214        | 246        | 277        | 318        | 352        | 13%        |
| - Electronic Information Svcs   | 101        | 8%           | 109        | 120        | 131        | 142        | 156        | 164        | 9%         |
| - Network Applications          | 63         | 18%          | 74         | 90         | 107        | 128        | 153        | 176        | 19%        |
| - Network Management            | 5          | 10%          | 5          | 6          | 7          | 8          | 9          | 12         | 17%        |
| <b>Applications SW Products</b> | 460        | 14%          | 530        | 665        | 750        | 800        | 875        | 935        | 12%        |
| - Mainframe                     | 33         | 0%           | 33         | 33         | 33         | 33         | 33         | 32         | -1%        |
| - Minicomputer                  | 134        | 11%          | 148        | 164        | 181        | 200        | 220        | 238        | 10%        |
| - Workstation/PC                | 295        | 18%          | 350        | 465        | 535        | 570        | 625        | 665        | 14%        |
| <b>Systems SW Products</b>      | 450        | 6%           | 475        | 515        | 530        | 550        | 580        | 590        | 4%         |
| - Mainframe                     | 202        | -1%          | 200        | 198        | 197        | 195        | 195        | 189        | -1%        |
| - Minicomputer                  | 148        | 6%           | 157        | 167        | 178        | 189        | 202        | 209        | 6%         |
| - Workstation/PC                | 99         | 19%          | 118        | 146        | 156        | 167        | 184        | 192        | 10%        |
| <b>Turnkey Systems</b>          | 335        | 8%           | 361        | 385        | 410        | 437        | 469        | 491        | 6%         |
| - Equipment                     | 157        | 4%           | 164        | 167        | 170        | 173        | 179        | 179        | 2%         |
| - Applications Software         | 74         | 13%          | 84         | 93         | 104        | 117        | 129        | 140        | 11%        |
| - Systems Software              | 15         | 5%           | 16         | 17         | 17         | 18         | 19         | 19         | 4%         |
| - Professional Services         | 89         | 10%          | 98         | 108        | 118        | 129        | 142        | 152        | 9%         |

Note: Numbers are rounded





# Worldwide Information Services Program

## Information Services Market Forecast Central and Eastern Europe, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>AREA TOTAL</b>               | 715        | 16%          | 830        | 990        | 1,175      | 1,385      | 1,655      | 1,955      | 19%        |
| <b>Professional Services</b>    | 71         | 14%          | 81         | 93         | 107        | 125        | 144        | 165        | 15%        |
| - IS Consulting                 | 2          | 0%           | 2          | 2          | 2          | 2          | 2          | 2          | 0%         |
| - Education & Training          | 41         | 15%          | 47         | 55         | 64         | 76         | 89         | 105        | 17%        |
| - Software Development          | 28         | 14%          | 32         | 36         | 41         | 47         | 53         | 58         | 13%        |
| - Application Management        | 0          | 0%           | 0          | 0          | 0          | 0          | 0          | 0          | 0%         |
| <b>Systems Integration</b>      | 410        | 12%          | 460        | 530        | 625        | 735        | 865        | 1,010      | 17%        |
| - Equipment                     | 94         | 7%           | 101        | 111        | 119        | 125        | 147        | 172        | 11%        |
| - Applications Software         | 57         | 30%          | 74         | 90         | 125        | 162        | 207        | 262        | 29%        |
| - Systems Software              | 33         | -3%          | 32         | 37         | 44         | 52         | 52         | 71         | 17%        |
| - Professional Services         | 193        | 12%          | 216        | 249        | 294        | 346        | 405        | 444        | 16%        |
| - Other                         | 33         | 12%          | 37         | 42         | 44         | 52         | 52         | 61         | 11%        |
| <b>Outsourcing</b>              | 20         | 35%          | 27         | 32         | 42         | 50         | 60         | 72         | 22%        |
| - Platform Operations           | 9          | 33%          | 12         | 15         | 20         | 25         | 28         | 35         | 24%        |
| - Applications Operations       | 8          | 38%          | 11         | 12         | 15         | 15         | 20         | 22         | 15%        |
| - Desktop Services              | 3          | 33%          | 4          | 5          | 7          | 10         | 12         | 15         | 30%        |
| <b>Processing Services</b>      | 20         | 25%          | 25         | 29         | 36         | 45         | 59         | 79         | 26%        |
| - Transaction Processing        | 10         | 20%          | 12         | 13         | 15         | 17         | 20         | 24         | 15%        |
| - Utility Processing            | 6          | 17%          | 7          | 7          | 8          | 8          | 9          | 10         | 7%         |
| - Other Processing              | 4          | 50%          | 6          | 9          | 13         | 20         | 30         | 45         | 49%        |
| <b>Network Services</b>         | 8          | 13%          | 9          | 13         | 19         | 27         | 39         | 57         | 45%        |
| - Electronic Information Svcs   | 1          | 0%           | 1          | 1          | 2          | 2          | 3          | 3          | 43%        |
| - Network Applications          | 4          | 50%          | 6          | 9          | 14         | 21         | 31         | 47         | 51%        |
| - Network Management            | 3          | -7%          | 3          | 3          | 4          | 4          | 5          | 7          | 20%        |
| <b>Applications SW Products</b> | 94         | 20%          | 113        | 148        | 173        | 194        | 228        | 260        | 18%        |
| - Mainframe                     | 10         | 0%           | 10         | 11         | 11         | 11         | 11         | 11         | 2%         |
| - Minicomputer                  | 30         | 17%          | 35         | 41         | 47         | 54         | 62         | 71         | 15%        |
| - Workstation/PC                | 54         | 26%          | 68         | 96         | 115        | 129        | 155        | 178        | 21%        |
| <b>Systems SW Products</b>      | 67         | 21%          | 81         | 101        | 119        | 141        | 170        | 202        | 20%        |
| - Mainframe                     | 15         | 0%           | 15         | 16         | 16         | 16         | 16         | 16         | 1%         |
| - Minicomputer                  | 21         | 19%          | 25         | 29         | 35         | 42         | 50         | 60         | 19%        |
| - Workstation/PC                | 31         | 32%          | 41         | 57         | 69         | 84         | 104        | 126        | 25%        |
| <b>Turnkey Systems</b>          | 27         | 22%          | 33         | 43         | 54         | 69         | 88         | 111        | 27%        |
| - Equipment                     | 13         | 23%          | 16         | 20         | 25         | 31         | 39         | 48         | 25%        |
| - Applications Software         | 5          | 20%          | 6          | 8          | 10         | 13         | 17         | 22         | 30%        |
| - Systems Software              | 1          | 0%           | 1          | 2          | 2          | 3          | 3          | 4          | 32%        |
| - Professional Services         | 8          | 25%          | 10         | 13         | 17         | 22         | 29         | 37         | 30%        |

Note: Numbers are rounded







# Worldwide Information Services Program

## Information Services Market Forecast Denmark, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 2,105      | 6%           | 2,235      | 2,420      | 2,580      | 2,730      | 2,895      | 3,045      | 6%         |
| <b>Professional Services</b>    | 500        | 7%           | 535        | 565        | 610        | 650        | 690        | 740        | 7%         |
| - IS Consulting                 | 94         | 11%          | 104        | 115        | 129        | 143        | 160        | 176        | 11%        |
| - Education & Training          | 45         | 5%           | 47         | 50         | 53         | 55         | 58         | 61         | 5%         |
| - Software Development          | 360        | 5%           | 380        | 395        | 420        | 445        | 470        | 495        | 5%         |
| - Application Management        | 4          | 20%          | 5          | 5          | 6          | 7          | 9          | 12         | 18%        |
| <b>Systems Integration</b>      | 50         | 8%           | 55         | 60         | 69         | 78         | 90         | 101        | 13%        |
| - Equipment                     | 12         | 4%           | 12         | 13         | 14         | 14         | 15         | 17         | 7%         |
| - Applications Software         | 8          | 14%          | 9          | 10         | 13         | 18         | 23         | 28         | 25%        |
| - Systems Software              | 4          | 8%           | 4          | 5          | 5          | 5          | 6          | 7          | 11%        |
| - Professional Services         | 24         | 6%           | 25         | 29         | 33         | 37         | 43         | 44         | 12%        |
| - Other                         | 3          | 28%          | 4          | 4          | 4          | 4          | 3          | 4          | 1%         |
| <b>Outsourcing</b>              | 38         | 17%          | 45         | 53         | 63         | 74         | 86         | 101        | 18%        |
| - Platform Operations           | 10         | 17%          | 12         | 13         | 15         | 17         | 18         | 21         | 12%        |
| - Applications Operations       | 18         | 14%          | 21         | 24         | 27         | 32         | 38         | 44         | 16%        |
| - Desktop Services              | 9          | 27%          | 12         | 16         | 20         | 25         | 30         | 36         | 26%        |
| <b>Processing Services</b>      | 487        | -1%          | 484        | 479        | 474        | 466        | 456        | 443        | -2%        |
| - Transaction Processing        | 444        | -1%          | 439        | 434        | 428        | 420        | 408        | 395        | -2%        |
| - Utility Processing            | 9          | -2%          | 9          | 9          | 8          | 8          | 8          | 7          | -3%        |
| - Other Processing              | 34         | 6%           | 36         | 36         | 38         | 39         | 40         | 41         | 3%         |
| <b>Network Services</b>         | 110        | 13%          | 125        | 145        | 166        | 189        | 211        | 235        | 13%        |
| - Electronic Information Svcs   | 64         | 8%           | 69         | 78         | 86         | 92         | 99         | 104        | 8%         |
| - Network Applications          | 43         | 19%          | 51         | 63         | 76         | 91         | 106        | 124        | 19%        |
| - Network Management            | 4          | 9%           | 4          | 5          | 5          | 6          | 7          | 8          | 15%        |
| <b>Applications SW Products</b> | 265        | 9%           | 290        | 360        | 405        | 435        | 475        | 510        | 12%        |
| - Mainframe                     | 15         | -5%          | 14         | 14         | 14         | 13         | 13         | 12         | -3%        |
| - Minicomputer                  | 78         | 5%           | 82         | 89         | 97         | 105        | 111        | 117        | 7%         |
| - Workstation/PC                | 170        | 15%          | 190        | 260        | 295        | 315        | 355        | 380        | 14%        |
| <b>Systems SW Products</b>      | 295        | 8%           | 320        | 355        | 370        | 385        | 405        | 410        | 5%         |
| - Mainframe                     | 112        | 1%           | 114        | 112        | 112        | 110        | 109        | 106        | -1%        |
| - Minicomputer                  | 104        | 8%           | 112        | 120        | 129        | 137        | 142        | 147        | 6%         |
| - Workstation/PC                | 79         | 21%          | 96         | 121        | 131        | 139        | 155        | 162        | 11%        |
| <b>Turnkey Systems</b>          | 357        | 6%           | 380        | 405        | 433        | 459        | 481        | 499        | 6%         |
| - Equipment                     | 165        | 3%           | 170        | 174        | 179        | 182        | 183        | 182        | 1%         |
| - Applications Software         | 69         | 10%          | 76         | 83         | 92         | 100        | 107        | 114        | 8%         |
| - Systems Software              | 22         | 6%           | 24         | 25         | 26         | 28         | 29         | 29         | 4%         |
| - Professional Services         | 101        | 11%          | 112        | 124        | 137        | 150        | 163        | 175        | 9%         |

Note: Numbers are rounded





# Worldwide Information Services Program

## Information Services Market Forecast Finland, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 1,280      | 5%           | 1,340      | 1,460      | 1,560      | 1,665      | 1,810      | 1,960      | 8%         |
| <b>Professional Services</b>    | 340        | 2%           | 350        | 365        | 385        | 410        | 445        | 485        | 7%         |
| - IS Consulting                 | 60         | 5%           | 64         | 69         | 75         | 84         | 94         | 106        | 11%        |
| - Education & Training          | 32         | 1%           | 32         | 33         | 34         | 36         | 38         | 40         | 5%         |
| - Software Development          | 250        | 1%           | 250        | 260        | 270        | 290        | 310        | 340        | 6%         |
| - Application Management        | 2          | 14%          | 2          | 2          | 2          | 3          | 3          | 4          | 20%        |
| <b>Systems Integration</b>      | 45         | 14%          | 51         | 58         | 67         | 76         | 86         | 98         | 14%        |
| - Equipment                     | 10         | 10%          | 11         | 12         | 13         | 14         | 15         | 17         | 8%         |
| - Applications Software         | 6          | 31%          | 8          | 10         | 13         | 18         | 21         | 25         | 26%        |
| - Systems Software              | 4          | 12%          | 4          | 5          | 5          | 5          | 5          | 6          | 8%         |
| - Professional Services         | 21         | 14%          | 24         | 28         | 32         | 35         | 41         | 44         | 13%        |
| - Other                         | 4          | 0%           | 4          | 4          | 4          | 5          | 5          | 6          | 10%        |
| <b>Outsourcing</b>              | 68         | 17%          | 79         | 91         | 105        | 122        | 141        | 162        | 15%        |
| - Platform Operations           | 23         | 15%          | 27         | 31         | 35         | 39         | 43         | 48         | 12%        |
| - Applications Operations       | 39         | 15%          | 45         | 52         | 59         | 70         | 81         | 95         | 16%        |
| - Desktop Services              | 5          | 32%          | 7          | 8          | 11         | 13         | 15         | 19         | 22%        |
| <b>Processing Services</b>      | 201        | 0%           | 201        | 201        | 201        | 202        | 200        | 200        | 0%         |
| - Transaction Processing        | 180        | -1%          | 179        | 179        | 177        | 177        | 175        | 174        | 0%         |
| - Utility Processing            | 6          | -4%          | 5          | 5          | 5          | 4          | 4          | 4          | -6%        |
| - Other Processing              | 16         | 4%           | 17         | 18         | 19         | 20         | 21         | 21         | 5%         |
| <b>Network Services</b>         | 66         | 13%          | 74         | 85         | 95         | 108        | 123        | 142        | 14%        |
| - Electronic Information Svcs   | 35         | 9%           | 38         | 42         | 47         | 51         | 55         | 60         | 10%        |
| - Network Applications          | 22         | 19%          | 27         | 32         | 38         | 46         | 54         | 65         | 20%        |
| - Network Management            | 8          | 11%          | 9          | 10         | 11         | 12         | 14         | 17         | 14%        |
| <b>Applications SW Products</b> | 185        | 10%          | 205        | 255        | 285        | 310        | 350        | 385        | 14%        |
| - Mainframe                     | 13         | -8%          | 12         | 11         | 11         | 11         | 10         | 10         | -4%        |
| - Minicomputer                  | 54         | 8%           | 58         | 65         | 72         | 79         | 89         | 98         | 11%        |
| - Workstation/PC                | 115        | 14%          | 130        | 180        | 205        | 220        | 250        | 275        | 16%        |
| <b>Systems SW Products</b>      | 165        | -3%          | 160        | 170        | 170        | 175        | 180        | 185        | 3%         |
| - Mainframe                     | 61         | -14%         | 53         | 48         | 43         | 40         | 37         | 35         | -8%        |
| - Minicomputer                  | 57         | 0%           | 57         | 58         | 60         | 64         | 68         | 72         | 5%         |
| - Workstation/PC                | 48         | 11%          | 53         | 62         | 65         | 69         | 74         | 79         | 8%         |
| <b>Turnkey Systems</b>          | 211        | 5%           | 222        | 237        | 253        | 268        | 287        | 304        | 7%         |
| - Equipment                     | 97         | 2%           | 99         | 104        | 107        | 110        | 113        | 116        | 3%         |
| - Applications Software         | 42         | 10%          | 47         | 51         | 56         | 61         | 68         | 74         | 10%        |
| - Systems Software              | 13         | 5%           | 14         | 15         | 15         | 16         | 17         | 18         | 6%         |
| - Professional Services         | 58         | 7%           | 62         | 69         | 75         | 81         | 89         | 96         | 9%         |

Note: Numbers are rounded







# Worldwide Information Services Program

## Information Services Market Forecast France, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 20,225     | 4%           | 20,975     | 22,470     | 23,595     | 24,720     | 26,590     | 28,275     | 6%         |
| <b>Professional Services</b>    | 7,265      | 2%           | 7,380      | 7,510      | 7,640      | 7,715      | 7,830      | 7,940      | 1%         |
| - IS Consulting                 | 899        | 10%          | 993        | 1,040      | 1,105      | 1,171      | 1,255      | 1,339      | 6%         |
| - Education & Training          | 676        | 6%           | 717        | 767        | 821        | 870        | 922        | 977        | 6%         |
| - Software Development          | 5,635      | -1%          | 5,600      | 5,610      | 5,600      | 5,535      | 5,480      | 5,420      | -1%        |
| - Application Management        | 49         | 35%          | 66         | 86         | 112        | 139        | 174        | 206        | 26%        |
| <b>Systems Integration</b>      | 1,011      | 8%           | 1,096      | 1,217      | 1,339      | 1,480      | 1,629      | 1,807      | 11%        |
| - Equipment                     | 253        | 8%           | 274        | 279        | 280        | 282        | 296        | 308        | 2%         |
| - Applications Software         | 182        | 14%          | 208        | 255        | 307        | 370        | 444        | 506        | 20%        |
| - Systems Software              | 81         | 8%           | 87         | 85         | 93         | 104        | 115        | 127        | 8%         |
| - Professional Services         | 476        | 6%           | 503        | 558        | 614        | 682        | 723        | 796        | 10%        |
| - Other                         | 20         | 8%           | 22         | 36         | 40         | 44         | 49         | 72         | 27%        |
| <b>Outsourcing</b>              | 880        | 18%          | 1,038      | 1,255      | 1,489      | 1,723      | 1,985      | 2,294      | 17%        |
| - Platform Operations           | 296        | 12%          | 332        | 375        | 412        | 459        | 506        | 543        | 10%        |
| - Applications Operations       | 487        | 18%          | 575        | 702        | 843        | 965        | 1,105      | 1,283      | 17%        |
| - Desktop Services              | 97         | 35%          | 131        | 178        | 234        | 300        | 375        | 468        | 29%        |
| <b>Processing Services</b>      | 1,667      | 0%           | 1,667      | 1,658      | 1,676      | 1,714      | 1,789      | 1,873      | 2%         |
| - Transaction Processing        | 1,433      | -1%          | 1,423      | 1,395      | 1,395      | 1,414      | 1,470      | 1,526      | 1%         |
| - Utility Processing            | 67         | 0%           | 67         | 65         | 64         | 64         | 65         | 66         | 0%         |
| - Other Processing              | 164        | 10%          | 181        | 199        | 217        | 237        | 257        | 276        | 9%         |
| <b>Network Services</b>         | 1,564      | 9%           | 1,704      | 1,908      | 2,156      | 2,483      | 2,946      | 3,517      | 16%        |
| - Electronic Information Svcs   | 880        | 9%           | 955        | 1,030      | 1,105      | 1,189      | 1,311      | 1,433      | 8%         |
| - Network Applications          | 526        | 7%           | 565        | 662        | 799        | 997        | 1,284      | 1,667      | 24%        |
| - Network Management            | 158        | 17%          | 185        | 216        | 252        | 297        | 351        | 418        | 18%        |
| <b>Applications SW Products</b> | 2,790      | 5%           | 2,920      | 3,390      | 3,615      | 3,725      | 4,100      | 4,325      | 8%         |
| - Mainframe                     | 161        | -14%         | 139        | 120        | 106        | 95         | 87         | 81         | -10%       |
| - Minicomputer                  | 813        | 1%           | 820        | 834        | 879        | 949        | 1,005      | 1,031      | 5%         |
| - Workstation/PC                | 1,815      | 8%           | 1,960      | 2,435      | 2,625      | 2,690      | 3,015      | 3,220      | 10%        |
| <b>Systems SW Products</b>      | 2,960      | 4%           | 3,090      | 3,275      | 3,295      | 3,350      | 3,500      | 3,615      | 3%         |
| - Mainframe                     | 1,180      | -4%          | 1,133      | 1,086      | 1,021      | 946        | 880        | 796        | -7%        |
| - Minicomputer                  | 993        | 4%           | 1,030      | 1,049      | 1,077      | 1,124      | 1,189      | 1,264      | 4%         |
| - Workstation/PC                | 787        | 18%          | 924        | 1,144      | 1,203      | 1,279      | 1,438      | 1,555      | 11%        |
| <b>Turnkey Systems</b>          | 2,060      | 4%           | 2,135      | 2,229      | 2,341      | 2,528      | 2,734      | 2,959      | 7%         |
| - Equipment                     | 1,011      | 2%           | 1,030      | 1,049      | 1,077      | 1,114      | 1,161      | 1,208      | 3%         |
| - Applications Software         | 487        | 6%           | 515        | 553        | 590        | 665        | 740        | 824        | 10%        |
| - Systems Software              | 36         | 5%           | 37         | 40         | 43         | 45         | 48         | 51         | 6%         |
| - Professional Services         | 525        | 6%           | 555        | 594        | 633        | 702        | 791        | 880        | 10%        |

Note: Numbers are rounded





## Information Services Market Forecast Germany, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 17,400     | 8%           | 18,800     | 20,700     | 22,600     | 24,500     | 26,900     | 29,300     | 9%         |
| <b>Professional Services</b>    | 3,400      | 3%           | 3,500      | 3,600      | 3,800      | 3,900      | 4,100      | 4,100      | 3%         |
| - IS Consulting                 | 600        | 12%          | 670        | 750        | 860        | 950        | 1,050      | 1,150      | 11%        |
| - Education & Training          | 710        | 8%           | 770        | 840        | 900        | 970        | 1,030      | 1,090      | 7%         |
| - Software Development          | 2,000      | -2%          | 2,000      | 2,000      | 2,000      | 1,900      | 1,900      | 1,800      | -2%        |
| - Application Management        | 21         | 36%          | 29         | 39         | 48         | 61         | 77         | 90         | 25%        |
| <b>Systems Integration</b>      | 710        | 14%          | 810        | 870        | 1,000      | 1,100      | 1,230      | 1,390      | 11%        |
| - Equipment                     | 200        | 6%           | 210        | 180        | 180        | 190        | 200        | 220        | 1%         |
| - Applications Software         | 145        | 21%          | 175        | 186        | 228        | 274        | 332        | 388        | 17%        |
| - Systems Software              | 51         | 9%           | 55         | 62         | 69         | 77         | 86         | 97         | 12%        |
| - Professional Services         | 300        | 7%           | 320        | 420        | 480        | 500        | 550        | 610        | 14%        |
| - Other                         | 36         | 11%          | 40         | 35         | 39         | 55         | 61         | 70         | 12%        |
| <b>Outsourcing</b>              | 310        | 58%          | 490        | 650        | 830        | 1,050      | 1,250      | 1,460      | 24%        |
| - Platform Operations           | 60         | 15%          | 70         | 80         | 90         | 110        | 120        | 130        | 12%        |
| - Applications Operations       | 180        | 80%          | 320        | 430        | 560        | 710        | 840        | 970        | 25%        |
| - Desktop Services              | 68         | 38%          | 94         | 129        | 174        | 226        | 290        | 368        | 31%        |
| <b>Processing Services</b>      | 1,680      | 8%           | 1,810      | 1,970      | 2,130      | 2,290      | 2,390      | 2,550      | 7%         |
| - Transaction Processing        | 1,390      | 7%           | 1,480      | 1,610      | 1,710      | 1,840      | 1,900      | 2,000      | 6%         |
| - Utility Processing            | 80         | 0%           | 80         | 80         | 80         | 80         | 80         | 80         | 0%         |
| - Other Processing              | 230        | 13%          | 250        | 290        | 330        | 370        | 420        | 460        | 13%        |
| <b>Network Services</b>         | 1,150      | 15%          | 1,320      | 1,550      | 1,860      | 2,220      | 2,660      | 3,240      | 20%        |
| - Electronic Information Svcs   | 770        | 10%          | 850        | 950        | 1,050      | 1,120      | 1,190      | 1,260      | 8%         |
| - Network Applications          | 250        | 34%          | 340        | 460        | 650        | 910        | 1,250      | 1,720      | 38%        |
| - Network Management            | 120        | 8%           | 130        | 150        | 160        | 180        | 210        | 250        | 14%        |
| <b>Applications SW Products</b> | 2,400      | 14%          | 2,700      | 3,400      | 3,800      | 4,200      | 4,900      | 5,500      | 15%        |
| - Mainframe                     | 250        | -5%          | 240        | 230        | 220        | 210        | 210        | 200        | -3%        |
| - Minicomputer                  | 680        | 10%          | 740        | 810        | 910        | 1,050      | 1,220      | 1,460      | 15%        |
| - Workstation/PC                | 1,500      | 18%          | 1,700      | 2,300      | 2,700      | 2,900      | 3,400      | 3,800      | 17%        |
| <b>Systems SW Products</b>      | 3,400      | 6%           | 3,600      | 3,850      | 3,950      | 4,030      | 4,210      | 4,300      | 4%         |
| - Mainframe                     | 1,550      | -4%          | 1,480      | 1,420      | 1,320      | 1,160      | 1,030      | 870        | -10%       |
| - Minicomputer                  | 1,000      | 3%           | 1,030      | 1,100      | 1,160      | 1,230      | 1,290      | 1,350      | 6%         |
| - Workstation/PC                | 870        | 23%          | 1,070      | 1,330      | 1,470      | 1,640      | 1,890      | 2,110      | 15%        |
| <b>Turnkey Systems</b>          | 4,390      | 4%           | 4,580      | 4,840      | 5,290      | 5,680      | 6,190      | 6,710      | 8%         |
| - Equipment                     | 2,130      | 0%           | 2,130      | 2,190      | 2,260      | 2,320      | 2,390      | 2,450      | 3%         |
| - Applications Software         | 840        | 12%          | 940        | 1,000      | 1,190      | 1,320      | 1,550      | 1,740      | 13%        |
| - Systems Software              | 297        | 2%           | 303        | 319        | 332        | 352        | 368        | 384        | 5%         |
| - Professional Services         | 1,130      | 9%           | 1,230      | 1,340      | 1,510      | 1,680      | 1,900      | 2,100      | 11%        |

Note: Numbers are rounded







# Worldwide Information Services Program

## Information Services Market Forecast Greece, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 287        | 10%          | 316        | 362        | 403        | 449        | 507        | 565        | 12%        |
| <b>Professional Services</b>    | 81         | 9%           | 89         | 97         | 106        | 118        | 131        | 144        | 10%        |
| - IS Consulting                 | 9          | 11%          | 10         | 12         | 13         | 15         | 17         | 19         | 13%        |
| - Education & Training          | 7          | 6%           | 8          | 8          | 9          | 9          | 10         | 11         | 7%         |
| - Software Development          | 65         | 9%           | 71         | 77         | 84         | 94         | 103        | 114        | 10%        |
| - Application Management        | 0          | 0%           | 0          | 0          | 0          | 0          | 0          | 0          | 0%         |
| <b>Systems Integration</b>      | 5          | 13%          | 6          | 7          | 8          | 9          | 10         | 11         | 15%        |
| - Equipment                     | 1          | 5%           | 1          | 1          | 1          | 1          | 2          | 2          | 6%         |
| - Applications Software         | 1          | 30%          | 1          | 1          | 2          | 2          | 2          | 3          | 27%        |
| - Systems Software              | 0          | 15%          | 0          | 1          | 1          | 1          | 1          | 1          | 12%        |
| - Professional Services         | 2          | 14%          | 3          | 3          | 4          | 4          | 5          | 5          | 15%        |
| - Other                         | 0          | 15%          | 0          | 1          | 1          | 1          | 1          | 1          | 12%        |
| <b>Outsourcing</b>              | 4          | 24%          | 4          | 5          | 6          | 7          | 9          | 10         | 18%        |
| - Platform Operations           | 1          | 17%          | 1          | 1          | 2          | 2          | 2          | 2          | 15%        |
| - Applications Operations       | 2          | 20%          | 3          | 3          | 4          | 4          | 6          | 6          | 19%        |
| - Desktop Services              | 0          | 19%          | 0          | 0          | 1          | 1          | 1          | 1          | 27%        |
| <b>Processing Services</b>      | 42         | 9%           | 46         | 50         | 54         | 59         | 65         | 70         | 9%         |
| - Transaction Processing        | 37         | 9%           | 41         | 44         | 48         | 53         | 58         | 63         | 9%         |
| - Utility Processing            | 2          | 5%           | 2          | 2          | 2          | 2          | 2          | 2          | 5%         |
| - Other Processing              | 3          | 9%           | 4          | 4          | 4          | 5          | 5          | 5          | 8%         |
| <b>Network Services</b>         | 15         | 16%          | 18         | 21         | 25         | 30         | 35         | 41         | 18%        |
| - Electronic Information Svcs   | 10         | 13%          | 11         | 12         | 14         | 16         | 18         | 20         | 13%        |
| - Network Applications          | 5          | 25%          | 6          | 8          | 10         | 13         | 16         | 20         | 26%        |
| - Network Management            | 1          | 10%          | 1          | 1          | 1          | 1          | 1          | 1          | 14%        |
| <b>Applications SW Products</b> | 33         | 19%          | 39         | 52         | 62         | 69         | 81         | 92         | 18%        |
| - Mainframe                     | 3          | -3%          | 2          | 2          | 2          | 2          | 2          | 2          | -3%        |
| - Minicomputer                  | 9          | 15%          | 10         | 11         | 13         | 15         | 18         | 20         | 16%        |
| - Workstation/PC                | 22         | 21%          | 27         | 39         | 46         | 51         | 61         | 70         | 21%        |
| <b>Systems SW Products</b>      | 48         | 9%           | 52         | 59         | 64         | 70         | 77         | 85         | 10%        |
| - Mainframe                     | 19         | -4%          | 18         | 17         | 17         | 16         | 16         | 16         | -2%        |
| - Minicomputer                  | 17         | 12%          | 19         | 22         | 25         | 29         | 33         | 37         | 14%        |
| - Workstation/PC                | 13         | 22%          | 16         | 20         | 22         | 25         | 29         | 32         | 16%        |
| <b>Turnkey Systems</b>          | 57         | 10%          | 62         | 69         | 77         | 88         | 100        | 113        | 13%        |
| - Equipment                     | 27         | 6%           | 29         | 31         | 33         | 36         | 40         | 43         | 9%         |
| - Applications Software         | 12         | 14%          | 14         | 16         | 18         | 22         | 26         | 30         | 17%        |
| - Systems Software              | 3          | 6%           | 3          | 3          | 4          | 4          | 4          | 5          | 9%         |
| - Professional Services         | 15         | 13%          | 16         | 19         | 22         | 26         | 30         | 35         | 16%        |

Note: Numbers are rounded





## Information Services Market Forecast Ireland, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 564        | 7%           | 603        | 657        | 703        | 750        | 811        | 866        | 8%         |
| <b>Professional Services</b>    | 145        | 2%           | 148        | 156        | 164        | 176        | 193        | 209        | 7%         |
| - IS Consulting                 | 17         | 0%           | 17         | 18         | 19         | 20         | 22         | 23         | 6%         |
| - Education & Training          | 14         | 0%           | 14         | 14         | 16         | 16         | 17         | 17         | 4%         |
| - Software Development          | 114        | 3%           | 117        | 124        | 130        | 141        | 155        | 168        | 7%         |
| - Application Management        | 0          | 0%           | 0          | 0          | 0          | 0          | 0          | 0          | 0%         |
| <b>Systems Integration</b>      | 14         | 22%          | 17         | 17         | 19         | 23         | 23         | 26         | 9%         |
| - Equipment                     | 3          | 0%           | 3          | 3          | 3          | 5          | 3          | 5          | 8%         |
| - Applications Software         | 2          | 100%         | 3          | 3          | 3          | 5          | 6          | 8          | 20%        |
| - Systems Software              | 2          | 0%           | 2          | 2          | 2          | 2          | 2          | 2          | 0%         |
| - Professional Services         | 6          | 25%          | 8          | 8          | 9          | 11         | 11         | 11         | 7%         |
| - Other                         | 2          | 0%           | 2          | 2          | 2          | 2          | 2          | 2          | 0%         |
| <b>Outsourcing</b>              | 14         | 22%          | 17         | 20         | 23         | 26         | 33         | 39         | 18%        |
| - Platform Operations           | 8          | 20%          | 9          | 11         | 12         | 14         | 17         | 19         | 15%        |
| - Applications Operations       | 5          | 33%          | 6          | 6          | 8          | 8          | 11         | 14         | 18%        |
| - Desktop Services              | 2          | 0%           | 2          | 3          | 3          | 5          | 5          | 6          | 32%        |
| <b>Processing Services</b>      | 56         | 0%           | 56         | 56         | 56         | 55         | 56         | 56         | 0%         |
| - Transaction Processing        | 42         | -4%          | 40         | 40         | 39         | 37         | 37         | 36         | -2%        |
| - Utility Processing            | 2          | 0%           | 2          | 2          | 2          | 2          | 2          | 2          | 0%         |
| - Other Processing              | 12         | 6%           | 13         | 14         | 15         | 16         | 17         | 18         | 6%         |
| <b>Network Services</b>         | 22         | 14%          | 25         | 29         | 34         | 40         | 45         | 53         | 16%        |
| - Electronic Information Svcs   | 12         | 13%          | 14         | 16         | 19         | 21         | 23         | 26         | 14%        |
| - Network Applications          | 8          | 20%          | 9          | 11         | 13         | 16         | 19         | 22         | 19%        |
| - Network Management            | 2          | 0%           | 2          | 2          | 2          | 3          | 3          | 3          | 15%        |
| <b>Applications SW Products</b> | 82         | 11%          | 91         | 110        | 121        | 125        | 134        | 142        | 9%         |
| - Mainframe                     | 8          | 0%           | 8          | 6          | 6          | 6          | 5          | 5          | -10%       |
| - Minicomputer                  | 20         | 4%           | 21         | 22         | 24         | 26         | 27         | 29         | 7%         |
| - Workstation/PC                | 54         | 14%          | 62         | 80         | 90         | 93         | 102        | 108        | 12%        |
| <b>Systems SW Products</b>      | 91         | 2%           | 93         | 97         | 100        | 103        | 104        | 104        | 2%         |
| - Mainframe                     | 39         | -8%          | 36         | 33         | 32         | 30         | 28         | 26         | -6%        |
| - Minicomputer                  | 29         | 3%           | 30         | 31         | 33         | 34         | 35         | 36         | 3%         |
| - Workstation/PC                | 23         | 17%          | 27         | 33         | 36         | 39         | 42         | 43         | 10%        |
| <b>Turnkey Systems</b>          | 139        | 11%          | 155        | 170        | 186        | 201        | 224        | 240        | 9%         |
| - Equipment                     | 71         | 5%           | 75         | 80         | 84         | 87         | 91         | 95         | 5%         |
| - Applications Software         | 29         | 16%          | 34         | 39         | 44         | 50         | 57         | 65         | 14%        |
| - Systems Software              | 5          | 0%           | 5          | 5          | 5          | 5          | 5          | 5          | 0%         |
| - Professional Services         | 37         | 15%          | 43         | 48         | 54         | 61         | 69         | 77         | 13%        |

Note: Numbers are rounded







# Worldwide Information Services Program

## Information Services Market Forecast Italy, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 7,300      | 6%           | 7,800      | 8,600      | 9,200      | 9,900      | 10,700     | 11,500     | 8%         |
| <b>Professional Services</b>    | 2,100      | 0%           | 2,100      | 2,100      | 2,200      | 2,200      | 2,300      | 2,500      | 3%         |
| - IS Consulting                 | 340        | 10%          | 370        | 390        | 420        | 470        | 540        | 610        | 10%        |
| - Education & Training          | 160        | 6%           | 170        | 170        | 180        | 190        | 210        | 220        | 5%         |
| - Software Development          | 1,600      | -4%          | 1,500      | 1,500      | 1,600      | 1,600      | 1,600      | 1,600      | 1%         |
| - Application Management        | 19         | 10%          | 20         | 22         | 25         | 31         | 39         | 49         | 19%        |
| <b>Systems Integration</b>      | 330        | 9%           | 360        | 400        | 440        | 490        | 550        | 600        | 11%        |
| - Equipment                     | 90         | 1%           | 90         | 90         | 90         | 100        | 100        | 100        | 4%         |
| - Applications Software         | 59         | 16%          | 69         | 83         | 101        | 113        | 136        | 169        | 20%        |
| - Systems Software              | 23         | 11%          | 25         | 28         | 31         | 35         | 38         | 43         | 11%        |
| - Professional Services         | 150        | 12%          | 170        | 190        | 200        | 230        | 250        | 270        | 9%         |
| - Other                         | 7          | 9%           | 7          | 12         | 13         | 20         | 22         | 24         | 27%        |
| <b>Outsourcing</b>              | 270        | 33%          | 350        | 440        | 550        | 650        | 780        | 910        | 21%        |
| - Platform Operations           | 70         | 13%          | 80         | 90         | 100        | 120        | 130        | 140        | 12%        |
| - Applications Operations       | 150        | 40%          | 220        | 280        | 350        | 420        | 510        | 580        | 22%        |
| - Desktop Services              | 40         | 38%          | 56         | 71         | 93         | 117        | 148        | 185        | 27%        |
| <b>Processing Services</b>      | 710        | 0%           | 710        | 710        | 710        | 740        | 740        | 770        | 2%         |
| - Transaction Processing        | 640        | -2%          | 620        | 620        | 630        | 640        | 650        | 660        | 1%         |
| - Utility Processing            | 10         | 0%           | 10         | 10         | 10         | 10         | 10         | 10         | 0%         |
| - Other Processing              | 70         | 4%           | 70         | 80         | 80         | 90         | 100        | 100        | 7%         |
| <b>Network Services</b>         | 460        | 14%          | 520        | 610        | 700        | 820        | 960        | 1,140      | 17%        |
| - Electronic Information Svcs   | 260        | 5%           | 270        | 290        | 300        | 310        | 310        | 310        | 3%         |
| - Network Applications          | 160        | 31%          | 210        | 270        | 350        | 450        | 590        | 740        | 29%        |
| - Network Management            | 40         | 8%           | 40         | 50         | 50         | 60         | 60         | 80         | 15%        |
| <b>Applications SW Products</b> | 1,300      | 11%          | 1,400      | 1,800      | 2,000      | 2,200      | 2,500      | 2,700      | 13%        |
| - Mainframe                     | 90         | -6%          | 80         | 80         | 70         | 70         | 70         | 60         | -6%        |
| - Minicomputer                  | 300        | -8%          | 280        | 290        | 290        | 290        | 250        | 190        | -7%        |
| - Workstation/PC                | 900        | 20%          | 1,100      | 1,500      | 1,700      | 1,800      | 2,200      | 2,400      | 17%        |
| <b>Systems SW Products</b>      | 1,500      | 8%           | 1,600      | 1,800      | 1,900      | 1,900      | 2,000      | 2,000      | 5%         |
| - Mainframe                     | 530        | -4%          | 510        | 480        | 450        | 430        | 410        | 380        | -6%        |
| - Minicomputer                  | 490        | 5%           | 520        | 550        | 560        | 580        | 590        | 600        | 3%         |
| - Workstation/PC                | 460        | 24%          | 570        | 740        | 810        | 870        | 970        | 1,050      | 13%        |
| <b>Turnkey Systems</b>          | 670        | 2%           | 680        | 720        | 770        | 830        | 890        | 950        | 7%         |
| - Equipment                     | 330        | 3%           | 340        | 360        | 370        | 390        | 400        | 410        | 4%         |
| - Applications Software         | 160        | 0%           | 160        | 170        | 190        | 210        | 230        | 250        | 10%        |
| - Systems Software              | 8          | 8%           | 9          | 9          | 10         | 11         | 11         | 12         | 7%         |
| - Professional Services         | 170        | 2%           | 170        | 180        | 200        | 220        | 240        | 270        | 10%        |

Note: Numbers are rounded





# Worldwide Information Services Program

## Information Services Market Forecast Netherlands, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 4,945      | 7%           | 5,285      | 5,745      | 6,150      | 6,610      | 7,185      | 7,875      | 8%         |
| <b>Professional Services</b>    | 1,760      | 6%           | 1,855      | 1,970      | 2,090      | 2,225      | 2,425      | 2,735      | 8%         |
| - IS Consulting                 | 242        | 10%          | 265        | 290        | 319        | 351        | 394        | 460        | 12%        |
| - Education & Training          | 207        | 7%           | 222        | 237        | 254        | 274        | 296        | 323        | 8%         |
| - Software Development          | 1,280      | 4%           | 1,340      | 1,400      | 1,465      | 1,535      | 1,655      | 1,850      | 7%         |
| - Application Management        | 26         | 22%          | 32         | 40         | 52         | 66         | 83         | 103        | 27%        |
| <b>Systems Integration</b>      | 178        | 13%          | 201        | 233        | 265        | 299        | 334        | 371        | 13%        |
| - Equipment                     | 45         | 8%           | 49         | 49         | 51         | 54         | 54         | 59         | 4%         |
| - Applications Software         | 25         | 30%          | 32         | 44         | 53         | 69         | 83         | 97         | 25%        |
| - Systems Software              | 14         | 12%          | 16         | 18         | 21         | 21         | 24         | 26         | 10%        |
| - Professional Services         | 81         | 13%          | 91         | 108        | 125        | 141        | 160        | 174        | 14%        |
| - Other                         | 14         | 0%           | 14         | 14         | 16         | 15         | 13         | 15         | 1%         |
| <b>Outsourcing</b>              | 167        | 21%          | 201        | 242        | 290        | 354        | 426        | 515        | 21%        |
| - Platform Operations           | 46         | 19%          | 55         | 63         | 72         | 84         | 95         | 107        | 14%        |
| - Applications Operations       | 81         | 14%          | 92         | 107        | 127        | 150        | 181        | 222        | 19%        |
| - Desktop Services              | 40         | 36%          | 55         | 72         | 92         | 121        | 149        | 187        | 28%        |
| <b>Processing Services</b>      | 592        | 6%           | 627        | 661        | 696        | 742        | 782        | 828        | 6%         |
| - Transaction Processing        | 523        | 5%           | 552        | 581        | 609        | 650        | 684        | 724        | 6%         |
| - Utility Processing            | 16         | 0%           | 16         | 16         | 16         | 17         | 17         | 17         | 2%         |
| - Other Processing              | 54         | 9%           | 59         | 63         | 69         | 75         | 81         | 89         | 9%         |
| <b>Network Services</b>         | 288        | 14%          | 328        | 382        | 451        | 535        | 635        | 747        | 18%        |
| - Electronic Information Svcs   | 155        | 7%           | 167        | 184        | 204        | 227        | 250        | 273        | 10%        |
| - Network Applications          | 115        | 23%          | 141        | 178        | 224        | 282        | 354        | 437        | 25%        |
| - Network Management            | 17         | 10%          | 19         | 20         | 23         | 26         | 32         | 38         | 15%        |
| <b>Applications SW Products</b> | 700        | 7%           | 745        | 875        | 920        | 925        | 975        | 1,000      | 6%         |
| - Mainframe                     | 55         | -5%          | 52         | 52         | 49         | 46         | 46         | 43         | -4%        |
| - Minicomputer                  | 213        | 8%           | 230        | 250        | 273        | 296        | 322        | 351        | 9%         |
| - Workstation/PC                | 430        | 8%           | 465        | 570        | 600        | 580        | 610        | 605        | 5%         |
| <b>Systems SW Products</b>      | 690        | 0%           | 690        | 745        | 745        | 805        | 805        | 805        | 3%         |
| - Mainframe                     | 313        | -6%          | 293        | 282        | 270        | 259        | 242        | 227        | -5%        |
| - Minicomputer                  | 199        | 1%           | 201        | 210        | 219        | 227        | 230        | 233        | 3%         |
| - Workstation/PC                | 176        | 16%          | 204        | 253        | 273        | 293        | 316        | 331        | 10%        |
| <b>Turnkey Systems</b>          | 592        | 4%           | 615        | 632        | 661        | 713        | 782        | 868        | 7%         |
| - Equipment                     | 270        | 0%           | 270        | 265        | 265        | 270        | 285        | 302        | 2%         |
| - Applications Software         | 138        | 10%          | 153        | 164        | 181        | 204        | 233        | 270        | 12%        |
| - Systems Software              | 37         | 0%           | 37         | 37         | 37         | 38         | 40         | 43         | 3%         |
| - Professional Services         | 150        | 6%           | 158        | 170        | 181        | 199        | 222        | 250        | 10%        |

Note: Numbers are rounded







## Information Services Market Forecast Norway, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 1,730      | 3%           | 1,790      | 1,910      | 1,995      | 2,100      | 2,235      | 2,350      | 6%         |
| <b>Professional Services</b>    | 430        | 0%           | 430        | 435        | 450        | 475        | 490        | 505        | 3%         |
| - IS Consulting                 | 66         | 4%           | 69         | 73         | 79         | 85         | 91         | 98         | 7%         |
| - Education & Training          | 53         | 3%           | 54         | 56         | 59         | 62         | 65         | 69         | 5%         |
| - Software Development          | 305        | 0%           | 305        | 305        | 310        | 320        | 325        | 325        | 1%         |
| - Application Management        | 4          | 12%          | 4          | 4          | 5          | 6          | 8          | 10         | 20%        |
| <b>Systems Integration</b>      | 37         | 10%          | 41         | 46         | 52         | 58         | 64         | 72         | 12%        |
| - Equipment                     | 10         | 0%           | 10         | 10         | 10         | 10         | 10         | 11         | 3%         |
| - Applications Software         | 5          | 26%          | 7          | 8          | 10         | 13         | 15         | 18         | 22%        |
| - Systems Software              | 3          | 10%          | 3          | 4          | 4          | 5          | 4          | 5          | 9%         |
| - Professional Services         | 17         | 12%          | 19         | 21         | 25         | 27         | 31         | 35         | 13%        |
| - Other                         | 3          | -5%          | 3          | 3          | 3          | 4          | 3          | 4          | 5%         |
| <b>Outsourcing</b>              | 39         | 19%          | 47         | 55         | 65         | 75         | 88         | 102        | 17%        |
| - Platform Operations           | 14         | 17%          | 16         | 18         | 20         | 22         | 25         | 28         | 12%        |
| - Applications Operations       | 19         | 16%          | 22         | 25         | 28         | 33         | 39         | 45         | 16%        |
| - Desktop Services              | 7          | 30%          | 10         | 13         | 16         | 20         | 24         | 30         | 25%        |
| <b>Processing Services</b>      | 494        | 0%           | 494        | 490        | 491        | 491        | 493        | 494        | 0%         |
| - Transaction Processing        | 451        | 0%           | 451        | 447        | 447        | 447        | 447        | 447        | 0%         |
| - Utility Processing            | 9          | -3%          | 9          | 9          | 8          | 8          | 8          | 8          | -3%        |
| - Other Processing              | 34         | 2%           | 34         | 35         | 36         | 37         | 39         | 39         | 3%         |
| <b>Network Services</b>         | 68         | 7%           | 73         | 79         | 89         | 101        | 113        | 127        | 12%        |
| - Electronic Information Svcs   | 41         | 2%           | 42         | 43         | 47         | 51         | 54         | 57         | 7%         |
| - Network Applications          | 23         | 13%          | 26         | 31         | 36         | 44         | 51         | 61         | 19%        |
| - Network Management            | 5          | 10%          | 5          | 6          | 6          | 7          | 8          | 10         | 15%        |
| <b>Applications SW Products</b> | 215        | 11%          | 240        | 300        | 335        | 360        | 410        | 445        | 13%        |
| - Mainframe                     | 16         | -5%          | 15         | 15         | 15         | 15         | 14         | 14         | -1%        |
| - Minicomputer                  | 61         | 6%           | 65         | 70         | 76         | 82         | 88         | 96         | 8%         |
| - Workstation/PC                | 140        | 16%          | 160        | 215        | 245        | 265        | 305        | 335        | 16%        |
| <b>Systems SW Products</b>      | 210        | 4%           | 215        | 235        | 245        | 255        | 275        | 285        | 6%         |
| - Mainframe                     | 87         | -4%          | 83         | 82         | 81         | 80         | 79         | 79         | -1%        |
| - Minicomputer                  | 69         | 4%           | 72         | 76         | 82         | 88         | 93         | 100        | 7%         |
| - Workstation/PC                | 53         | 15%          | 61         | 77         | 83         | 90         | 101        | 109        | 12%        |
| <b>Turnkey Systems</b>          | 243        | 4%           | 252        | 261        | 269        | 286        | 304        | 317        | 5%         |
| - Equipment                     | 121        | 2%           | 123        | 125        | 127        | 132        | 137        | 140        | 3%         |
| - Applications Software         | 48         | 9%           | 53         | 57         | 62         | 69         | 76         | 83         | 10%        |
| - Systems Software              | 15         | 0%           | 15         | 16         | 16         | 16         | 17         | 17         | 3%         |
| - Professional Services         | 59         | 4%           | 61         | 63         | 65         | 69         | 73         | 76         | 5%         |

Note: Numbers are rounded





## Information Services Market Forecast Portugal, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 198        | 14%          | 226        | 262        | 299        | 344        | 388        | 433        | 14%        |
| <b>Professional Services</b>    | 52         | 12%          | 58         | 64         | 71         | 79         | 87         | 95         | 11%        |
| - IS Consulting                 | 7          | 17%          | 9          | 10         | 12         | 14         | 16         | 18         | 16%        |
| - Education & Training          | 6          | 12%          | 6          | 7          | 8          | 9          | 9          | 10         | 10%        |
| - Software Development          | 36         | 11%          | 40         | 43         | 47         | 52         | 56         | 59         | 8%         |
| - Application Management        | 3          | 9%           | 3          | 4          | 4          | 5          | 6          | 8          | 20%        |
| <b>Systems Integration</b>      | 12         | 16%          | 14         | 16         | 19         | 21         | 24         | 27         | 14%        |
| - Equipment                     | 3          | 11%          | 3          | 4          | 4          | 4          | 4          | 4          | 4%         |
| - Applications Software         | 2          | 32%          | 2          | 3          | 4          | 5          | 6          | 7          | 26%        |
| - Systems Software              | 1          | 1%           | 1          | 1          | 2          | 1          | 2          | 2          | 14%        |
| - Professional Services         | 5          | 18%          | 6          | 8          | 9          | 10         | 11         | 12         | 14%        |
| - Other                         | 1          | 1%           | 1          | 1          | 1          | 1          | 1          | 2          | 11%        |
| <b>Outsourcing</b>              | 8          | 20%          | 10         | 12         | 14         | 18         | 21         | 25         | 20%        |
| - Platform Operations           | 3          | 19%          | 3          | 4          | 4          | 5          | 5          | 6          | 15%        |
| - Applications Operations       | 4          | 20%          | 5          | 5          | 6          | 8          | 9          | 11         | 19%        |
| - Desktop Services              | 2          | 20%          | 2          | 3          | 3          | 5          | 6          | 8          | 27%        |
| <b>Processing Services</b>      | 22         | 13%          | 25         | 27         | 30         | 34         | 36         | 39         | 9%         |
| - Transaction Processing        | 20         | 11%          | 22         | 24         | 26         | 29         | 31         | 33         | 9%         |
| - Utility Processing            | 1          | 7%           | 1          | 1          | 1          | 1          | 1          | 1          | 4%         |
| - Other Processing              | 2          | 15%          | 2          | 3          | 3          | 4          | 4          | 5          | 14%        |
| <b>Network Services</b>         | 11         | 23%          | 14         | 17         | 22         | 28         | 34         | 41         | 25%        |
| - Electronic Information Svcs   | 7          | 21%          | 9          | 11         | 13         | 16         | 19         | 22         | 21%        |
| - Network Applications          | 3          | 34%          | 4          | 5          | 7          | 10         | 13         | 17         | 34%        |
| - Network Management            | 1          | 10%          | 1          | 1          | 1          | 1          | 2          | 2          | 14%        |
| <b>Applications SW Products</b> | 20         | 19%          | 24         | 31         | 36         | 41         | 45         | 50         | 16%        |
| - Mainframe                     | 1          | 5%           | 1          | 2          | 2          | 2          | 2          | 2          | 4%         |
| - Minicomputer                  | 6          | 11%          | 6          | 7          | 8          | 9          | 10         | 11         | 12%        |
| - Workstation/PC                | 13         | 22%          | 16         | 22         | 26         | 29         | 34         | 37         | 18%        |
| <b>Systems SW Products</b>      | 33         | 11%          | 37         | 43         | 47         | 53         | 58         | 64         | 12%        |
| - Mainframe                     | 13         | 0%           | 13         | 14         | 14         | 14         | 14         | 14         | 1%         |
| - Minicomputer                  | 12         | 14%          | 13         | 15         | 17         | 20         | 22         | 25         | 13%        |
| - Workstation/PC                | 8          | 27%          | 10         | 14         | 16         | 19         | 22         | 25         | 20%        |
| <b>Turnkey Systems</b>          | 40         | 14%          | 45         | 52         | 60         | 71         | 82         | 93         | 15%        |
| - Equipment                     | 19         | 10%          | 20         | 22         | 25         | 28         | 31         | 34         | 10%        |
| - Applications Software         | 8          | 20%          | 10         | 12         | 15         | 18         | 22         | 26         | 21%        |
| - Systems Software              | 2          | 12%          | 2          | 3          | 3          | 4          | 4          | 4          | 14%        |
| - Professional Services         | 11         | 18%          | 13         | 15         | 18         | 21         | 25         | 29         | 18%        |

Note: Numbers are rounded







## Information Services Market Forecast Spain, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 2,455      | 7%           | 2,620      | 2,905      | 3,160      | 3,440      | 3,790      | 4,140      | 10%        |
| <b>Professional Services</b>    | 690        | 4%           | 720        | 760        | 820        | 890        | 955        | 1,035      | 7%         |
| - IS Consulting                 | 107        | 11%          | 118        | 133        | 152        | 175        | 202        | 228        | 14%        |
| - Education & Training          | 65         | 1%           | 65         | 67         | 70         | 74         | 77         | 82         | 5%         |
| - Software Development          | 515        | 3%           | 530        | 555        | 595        | 630        | 670        | 705        | 6%         |
| - Application Management        | 5          | 10%          | 6          | 7          | 8          | 10         | 13         | 15         | 21%        |
| <b>Systems Integration</b>      | 145        | 11%          | 161        | 181        | 203        | 225        | 255        | 296        | 13%        |
| - Equipment                     | 36         | 2%           | 37         | 40         | 39         | 39         | 41         | 45         | 4%         |
| - Applications Software         | 20         | 27%          | 26         | 31         | 41         | 50         | 61         | 77         | 25%        |
| - Systems Software              | 12         | 11%          | 13         | 15         | 16         | 18         | 20         | 21         | 10%        |
| - Professional Services         | 65         | 13%          | 74         | 85         | 96         | 106        | 120        | 139        | 13%        |
| - Other                         | 12         | -3%          | 11         | 11         | 12         | 14         | 13         | 15         | 6%         |
| <b>Outsourcing</b>              | 64         | 19%          | 76         | 92         | 112        | 132        | 158        | 184        | 19%        |
| - Platform Operations           | 30         | 17%          | 35         | 41         | 47         | 54         | 61         | 68         | 14%        |
| - Applications Operations       | 28         | 20%          | 34         | 42         | 53         | 64         | 76         | 91         | 22%        |
| - Desktop Services              | 6          | 20%          | 7          | 9          | 12         | 15         | 20         | 25         | 28%        |
| <b>Processing Services</b>      | 262        | 4%           | 273        | 282        | 293        | 306        | 318        | 332        | 4%         |
| - Transaction Processing        | 224        | 4%           | 233        | 240        | 250        | 261        | 272        | 284        | 4%         |
| - Utility Processing            | 17         | 2%           | 17         | 17         | 17         | 17         | 17         | 18         | 1%         |
| - Other Processing              | 23         | 5%           | 24         | 25         | 26         | 28         | 29         | 30         | 5%         |
| <b>Network Services</b>         | 171        | 12%          | 192        | 219        | 253        | 293        | 339        | 385        | 15%        |
| - Electronic Information Svcs   | 105        | 9%           | 115        | 128        | 142        | 160        | 177        | 190        | 11%        |
| - Network Applications          | 44         | 21%          | 53         | 65         | 79         | 98         | 120        | 142        | 22%        |
| - Network Management            | 22         | 10%          | 25         | 27         | 31         | 36         | 43         | 53         | 17%        |
| <b>Applications SW Products</b> | 320        | 13%          | 360        | 465        | 540        | 595        | 685        | 765        | 16%        |
| - Mainframe                     | 23         | -5%          | 22         | 21         | 20         | 20         | 19         | 19         | -3%        |
| - Minicomputer                  | 86         | 7%           | 92         | 101        | 110        | 120        | 131        | 143        | 9%         |
| - Workstation/PC                | 210        | 19%          | 250        | 345        | 410        | 450        | 535        | 600        | 19%        |
| <b>Systems SW Products</b>      | 375        | 5%           | 390        | 420        | 430        | 450        | 480        | 510        | 5%         |
| - Mainframe                     | 139        | -7%          | 130        | 121        | 113        | 107        | 102        | 98         | -6%        |
| - Minicomputer                  | 136        | 4%           | 142        | 148        | 154        | 164        | 174        | 184        | 5%         |
| - Workstation/PC                | 99         | 20%          | 119        | 151        | 164        | 180        | 206        | 228        | 14%        |
| <b>Turnkey Systems</b>          | 429        | 4%           | 448        | 480        | 511        | 555        | 603        | 642        | 7%         |
| - Equipment                     | 202        | 1%           | 204        | 212        | 219        | 230        | 243        | 250        | 4%         |
| - Applications Software         | 91         | 8%           | 99         | 110        | 121        | 136        | 152        | 167        | 11%        |
| - Systems Software              | 25         | 2%           | 25         | 27         | 28         | 30         | 32         | 33         | 5%         |
| - Professional Services         | 111        | 8%           | 120        | 131        | 143        | 159        | 177        | 192        | 10%        |

Note: Numbers are rounded





## Information Services Market Forecast Sweden, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 3,215      | 7%           | 3,445      | 3,795      | 4,160      | 4,565      | 5,035      | 5,480      | 10%        |
| <b>Professional Services</b>    | 1,360      | 4%           | 1,415      | 1,505      | 1,630      | 1,790      | 1,950      | 2,085      | 8%         |
| - IS Consulting                 | 150        | 6%           | 159        | 174        | 193        | 216        | 240        | 261        | 10%        |
| - Education & Training          | 92         | 5%           | 96         | 102        | 110        | 118        | 126        | 135        | 7%         |
| - Software Development          | 1,105      | 3%           | 1,135      | 1,205      | 1,300      | 1,420      | 1,535      | 1,630      | 7%         |
| - Application Management        | 20         | 10%          | 22         | 25         | 30         | 38         | 47         | 55         | 21%        |
| <b>Systems Integration</b>      | 50         | 8%           | 54         | 61         | 68         | 74         | 84         | 90         | 11%        |
| - Equipment                     | 13         | 3%           | 13         | 13         | 13         | 14         | 14         | 15         | 2%         |
| - Applications Software         | 7          | 23%          | 9          | 10         | 13         | 16         | 20         | 24         | 22%        |
| - Systems Software              | 4          | 7%           | 4          | 5          | 5          | 5          | 6          | 6          | 8%         |
| - Professional Services         | 23         | 8%           | 24         | 28         | 32         | 36         | 40         | 42         | 11%        |
| - Other                         | 4          | -7%          | 4          | 4          | 4          | 4          | 4          | 5          | 4%         |
| <b>Outsourcing</b>              | 288        | 22%          | 353        | 429        | 516        | 611        | 720        | 835        | 19%        |
| - Platform Operations           | 68         | 18%          | 80         | 94         | 111        | 127        | 142        | 162        | 15%        |
| - Applications Operations       | 168        | 20%          | 202        | 243        | 286        | 337        | 397        | 458        | 18%        |
| - Desktop Services              | 53         | 36%          | 71         | 92         | 120        | 148        | 182        | 215        | 25%        |
| <b>Processing Services</b>      | 384        | 0%           | 384        | 382        | 383        | 385        | 387        | 391        | 0%         |
| - Transaction Processing        | 346        | 0%           | 345        | 342        | 342        | 342        | 342        | 343        | 0%         |
| - Utility Processing            | 8          | -1%          | 7          | 7          | 7          | 7          | 7          | 7          | -1%        |
| - Other Processing              | 31         | 4%           | 32         | 33         | 35         | 37         | 39         | 41         | 5%         |
| <b>Network Services</b>         | 144        | 12%          | 162        | 189        | 221        | 259        | 302        | 353        | 17%        |
| - Electronic Information Svcs   | 74         | 8%           | 80         | 90         | 101        | 113        | 124        | 136        | 11%        |
| - Network Applications          | 50         | 19%          | 59         | 74         | 92         | 113        | 139        | 168        | 23%        |
| - Network Management            | 20         | 10%          | 22         | 24         | 29         | 33         | 39         | 49         | 17%        |
| <b>Applications SW Products</b> | 335        | 15%          | 385        | 490        | 560        | 605        | 690        | 755        | 14%        |
| - Mainframe                     | 24         | -3%          | 23         | 22         | 22         | 21         | 20         | 20         | -3%        |
| - Minicomputer                  | 86         | 9%           | 94         | 103        | 112        | 122        | 133        | 146        | 9%         |
| - Workstation/PC                | 225        | 19%          | 270        | 365        | 425        | 460        | 535        | 590        | 17%        |
| <b>Systems SW Products</b>      | 310        | 2%           | 320        | 345        | 355        | 365        | 390        | 400        | 5%         |
| - Mainframe                     | 147        | -5%          | 140        | 136        | 132        | 128        | 124        | 120        | -3%        |
| - Minicomputer                  | 87         | 4%           | 90         | 96         | 102        | 108        | 115        | 121        | 6%         |
| - Workstation/PC                | 77         | 14%          | 88         | 115        | 123        | 132        | 150        | 162        | 13%        |
| <b>Turnkey Systems</b>          | 350        | 6%           | 370        | 397        | 424        | 471        | 518        | 566        | 9%         |
| - Equipment                     | 158        | 2%           | 160        | 166        | 173        | 183        | 194        | 202        | 5%         |
| - Applications Software         | 74         | 10%          | 82         | 91         | 102        | 116        | 133        | 149        | 13%        |
| - Systems Software              | 22         | 3%           | 22         | 23         | 24         | 25         | 26         | 28         | 4%         |
| - Professional Services         | 94         | 14%          | 108        | 115        | 128        | 148        | 168        | 189        | 12%        |

Note: Numbers are rounded







## Information Services Market Forecast Switzerland, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 3,015      | 8%           | 3,245      | 3,590      | 3,895      | 4,275      | 4,735      | 5,155      | 10%        |
| <b>Professional Services</b>    | 740        | 3%           | 765        | 800        | 855        | 925        | 1,010      | 1,105      | 8%         |
| - IS Consulting                 | 92         | 8%           | 99         | 111        | 126        | 145        | 168        | 195        | 14%        |
| - Education & Training          | 122        | 2%           | 125        | 128        | 134        | 141        | 148        | 156        | 5%         |
| - Software Development          | 525        | 2%           | 535        | 555        | 590        | 635        | 685        | 745        | 7%         |
| - Application Management        | 5          | 17%          | 5          | 5          | 6          | 8          | 10         | 11         | 16%        |
| <b>Systems Integration</b>      | 161        | 10%          | 176        | 191        | 218        | 241        | 264        | 283        | 10%        |
| - Equipment                     | 41         | 0%           | 41         | 43         | 41         | 41         | 43         | 45         | 2%         |
| - Applications Software         | 22         | 21%          | 27         | 33         | 41         | 56         | 63         | 73         | 22%        |
| - Systems Software              | 13         | 6%           | 14         | 14         | 15         | 17         | 18         | 20         | 8%         |
| - Professional Services         | 73         | 12%          | 81         | 90         | 105        | 114        | 128        | 133        | 10%        |
| - Other                         | 13         | 6%           | 14         | 14         | 15         | 15         | 13         | 11         | -4%        |
| <b>Outsourcing</b>              | 79         | 19%          | 94         | 115        | 141        | 173        | 210        | 250        | 22%        |
| - Platform Operations           | 18         | 17%          | 21         | 25         | 28         | 33         | 38         | 42         | 15%        |
| - Applications Operations       | 50         | 20%          | 60         | 73         | 90         | 111        | 134        | 161        | 22%        |
| - Desktop Services              | 11         | 20%          | 14         | 18         | 23         | 29         | 38         | 47         | 28%        |
| <b>Processing Services</b>      | 370        | 7%           | 397        | 420        | 451        | 481        | 519        | 558        | 7%         |
| - Transaction Processing        | 321        | 7%           | 344        | 363        | 390        | 416        | 447        | 481        | 7%         |
| - Utility Processing            | 13         | 0%           | 13         | 14         | 14         | 14         | 15         | 15         | 2%         |
| - Other Processing              | 37         | 8%           | 40         | 44         | 48         | 51         | 57         | 61         | 9%         |
| <b>Network Services</b>         | 203        | 11%          | 225        | 264        | 306        | 355        | 416        | 481        | 16%        |
| - Electronic Information Svcs   | 145        | 8%           | 157        | 176        | 199        | 222        | 248        | 271        | 12%        |
| - Network Applications          | 50         | 23%          | 61         | 77         | 96         | 122        | 153        | 191        | 26%        |
| - Network Management            | 9          | 9%           | 9          | 10         | 12         | 13         | 16         | 18         | 14%        |
| <b>Applications SW Products</b> | 405        | 13%          | 460        | 575        | 650        | 695        | 785        | 855        | 13%        |
| - Mainframe                     | 46         | -3%          | 45         | 44         | 42         | 41         | 40         | 38         | -3%        |
| - Minicomputer                  | 115        | 10%          | 126        | 138        | 153        | 168        | 183        | 203        | 10%        |
| - Workstation/PC                | 245        | 19%          | 290        | 395        | 450        | 485        | 560        | 615        | 16%        |
| <b>Systems SW Products</b>      | 580        | 4%           | 605        | 645        | 670        | 695        | 745        | 780        | 5%         |
| - Mainframe                     | 256        | -4%          | 245        | 233        | 225        | 218        | 214        | 206        | -3%        |
| - Minicomputer                  | 183        | 4%           | 191        | 199        | 210        | 222        | 237        | 252        | 6%         |
| - Workstation/PC                | 141        | 19%          | 168        | 214        | 233        | 256        | 294        | 325        | 14%        |
| <b>Turnkey Systems</b>          | 481        | 6%           | 512        | 565        | 619        | 695        | 771        | 848        | 11%        |
| - Equipment                     | 256        | 4%           | 267        | 287        | 306        | 332        | 363        | 390        | 8%         |
| - Applications Software         | 69         | 11%          | 77         | 88         | 99         | 115        | 134        | 153        | 15%        |
| - Systems Software              | 27         | 0%           | 27         | 31         | 34         | 38         | 42         | 46         | 11%        |
| - Professional Services         | 130        | 9%           | 141        | 161        | 180        | 206        | 233        | 260        | 13%        |

Note: Numbers are rounded





## Information Services Market Forecast United Kingdom, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 13,600     | 10%          | 15,000     | 16,700     | 18,300     | 20,000     | 21,900     | 23,800     | 10%        |
| <b>Professional Services</b>    | 3,100      | 3%           | 3,200      | 3,300      | 3,300      | 3,400      | 3,400      | 3,500      | 2%         |
| - IS Consulting                 | 700        | 10%          | 770        | 860        | 930        | 1,030      | 1,130      | 1,240      | 10%        |
| - Education & Training          | 310        | 5%           | 330        | 350        | 370        | 390        | 420        | 440        | 6%         |
| - Software Development          | 2,000      | -2%          | 2,000      | 1,900      | 1,900      | 1,800      | 1,700      | 1,500      | -5%        |
| - Application Management        | 70         | 33%          | 94         | 117        | 149        | 188        | 227        | 266        | 23%        |
| <b>Systems Integration</b>      | 1,370      | 14%          | 1,560      | 1,790      | 2,060      | 2,350      | 2,650      | 3,030      | 14%        |
| - Equipment                     | 340        | 5%           | 360        | 360        | 390        | 420        | 420        | 480        | 6%         |
| - Applications Software         | 247        | 20%          | 296        | 377        | 474        | 563        | 717        | 847        | 23%        |
| - Systems Software              | 95         | 15%          | 110        | 125        | 144        | 164        | 186        | 211        | 14%        |
| - Professional Services         | 640        | 16%          | 750        | 860        | 970        | 1,080      | 1,190      | 1,330      | 12%        |
| - Other                         | 41         | 15%          | 47         | 72         | 83         | 117        | 133        | 152        | 26%        |
| <b>Outsourcing</b>              | 1,250      | 28%          | 1,600      | 2,020      | 2,440      | 2,910      | 3,410      | 3,900      | 20%        |
| - Platform Operations           | 340        | 11%          | 380        | 440        | 470        | 520        | 560        | 590        | 9%         |
| - Applications Operations       | 770        | 35%          | 1,030      | 1,350      | 1,680      | 2,030      | 2,430      | 2,790      | 22%        |
| - Desktop Services              | 133        | 29%          | 172        | 227        | 282        | 352        | 423        | 509        | 24%        |
| <b>Processing Services</b>      | 890        | 7%           | 950        | 980        | 1,030      | 1,080      | 1,130      | 1,200      | 5%         |
| - Transaction Processing        | 670        | 5%           | 700        | 700        | 730        | 740        | 750        | 770        | 2%         |
| - Utility Processing            | 20         | 0%           | 20         | 20         | 20         | 20         | 20         | 20         | 0%         |
| - Other Processing              | 200        | 16%          | 230        | 250        | 280        | 320        | 360        | 410        | 12%        |
| <b>Network Services</b>         | 1,580      | 16%          | 1,830      | 2,120      | 2,450      | 2,820      | 3,250      | 3,700      | 15%        |
| - Electronic Information Svcs   | 1,020      | 12%          | 1,140      | 1,280      | 1,420      | 1,560      | 1,710      | 1,830      | 10%        |
| - Network Applications          | 420        | 26%          | 530        | 670        | 840        | 1,040      | 1,260      | 1,530      | 24%        |
| - Network Management            | 140        | 11%          | 160        | 170        | 200        | 230        | 270        | 340        | 17%        |
| <b>Applications SW Products</b> | 1,300      | 15%          | 1,500      | 1,800      | 2,100      | 2,200      | 2,500      | 2,600      | 12%        |
| - Mainframe                     | 100        | -5%          | 90         | 90         | 80         | 80         | 70         | 70         | -5%        |
| - Minicomputer                  | 340        | 9%           | 380        | 400        | 430        | 460        | 490        | 530        | 7%         |
| - Workstation/PC                | 800        | 20%          | 1,000      | 1,400      | 1,600      | 1,700      | 1,900      | 2,000      | 15%        |
| <b>Systems SW Products</b>      | 2,000      | 8%           | 2,100      | 2,300      | 2,400      | 2,500      | 2,600      | 2,700      | 5%         |
| - Mainframe                     | 780        | -5%          | 740        | 700        | 670        | 640        | 610        | 560        | -6%        |
| - Minicomputer                  | 630        | 10%          | 690        | 740        | 780        | 820        | 860        | 910        | 6%         |
| - Workstation/PC                | 550        | 24%          | 680        | 880        | 950        | 1,010      | 1,130      | 1,210      | 12%        |
| <b>Turnkey Systems</b>          | 2,140      | 6%           | 2,270      | 2,370      | 2,500      | 2,720      | 2,900      | 3,140      | 7%         |
| - Equipment                     | 1,060      | 5%           | 1,120      | 1,170      | 1,230      | 1,310      | 1,380      | 1,450      | 5%         |
| - Applications Software         | 360        | 11%          | 400        | 410        | 430        | 490        | 520        | 590        | 8%         |
| - Systems Software              | 180        | 4%           | 188        | 203        | 219        | 235        | 258        | 274        | 8%         |
| - Professional Services         | 530        | 6%           | 560        | 590        | 630        | 690        | 750        | 830        | 8%         |

Note: Numbers are rounded







## United Kingdom

September 1996

### Economic Overview

The United Kingdom (U.K.) economy has been growing for the last three years, though there was a slowdown in the first half of 1995. Although there were fears of a return to recession, growth has resumed. Consumers are expected to have increased disposable income through windfalls as building societies turn into banks and as tax-free savings accounts (TESSAs) mature. Tax cuts and interest rate reductions will also stimulate economic growth.

Key economic indicators for the U.K. are summarized in Exhibit 1.

#### Exhibit 1

#### Key Economic Indicators—U.K.

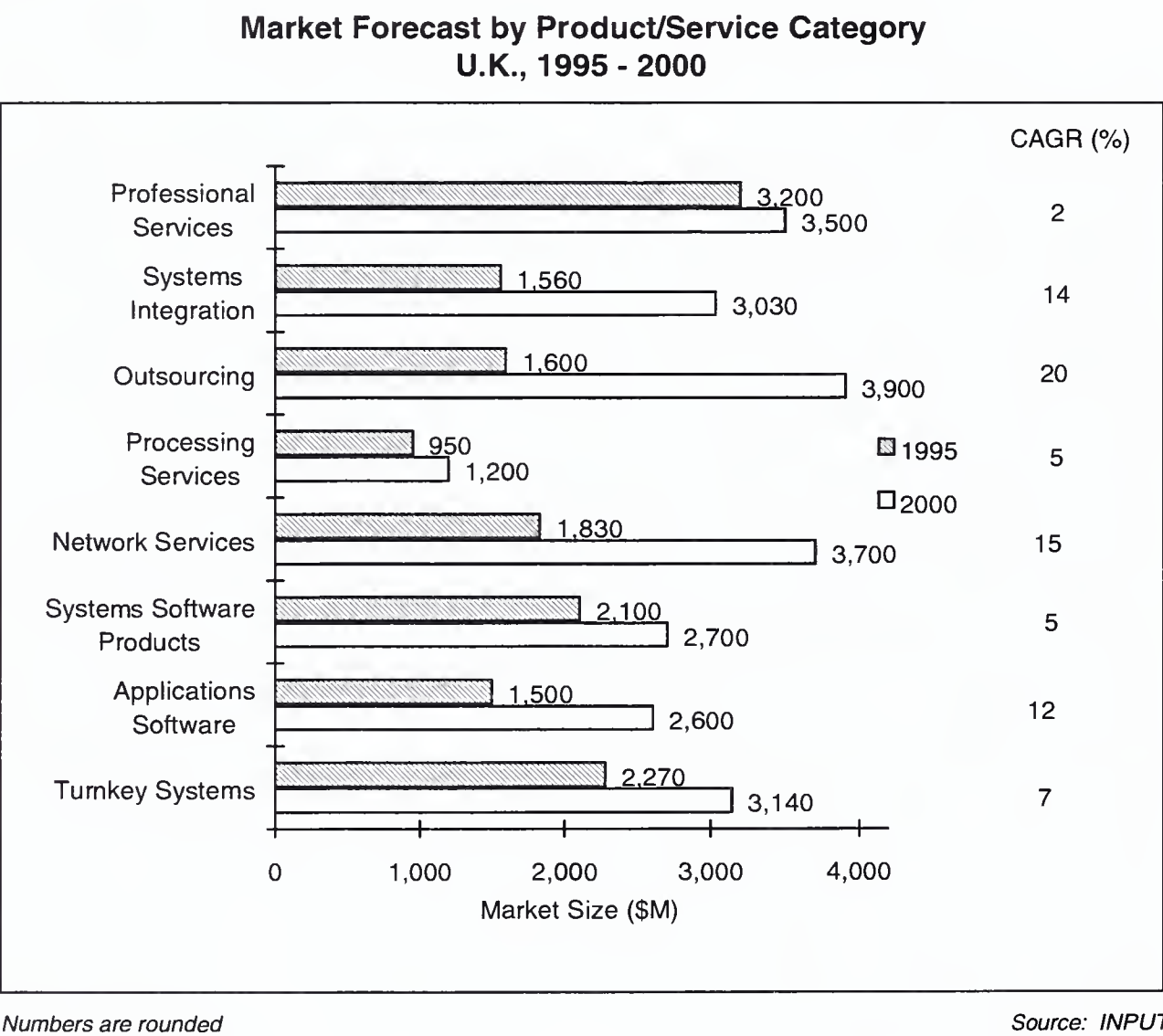
| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 3.4%  |
| - 1996                     | 3.0%  |
| Inflation Rate (1995-2000) | 2.9%  |
| Unemployment Rate          | 9.3%  |
| Exchange Rate              | 0.64  |

Sources: GDP and Inflation Data, OECD, 1994  
Exchange Rates, Financial Times, 1/95  
Unemployment Rates, CIA Factbook, 1995

Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2



The U.K. market is the third largest in Europe, worth £9.6 billion (\$15 billion) in 1995. It has the highest growth rate (10%) of the four major countries due to strong upward trends in systems integration, outsourcing, and network services.

This growth is partly due to the maturity of the outsourcing market in the U.K., enhanced by the government's Public Finance Initiative, which has boosted local and central

government markets, plus the fact that there is a higher proportion of larger-sized systems integration contracts in the U.K., compared with the rest of Europe.

The U.K. systems integration, outsourcing, and network services markets are the largest in Europe. The systems integration market has the highest growth rate (14%) across Europe for the next five years and will be worth over \$3 billion at the end of the decade.

Likewise, the U.K. also shows a high propensity to outsource operations, compared to the rest of Europe. The U.K. accounts for 35% of the total European outsourcing market. The slow growth in local government outsourcing in 1994 was a short-term phenomenon due to the more relaxed timetable for Compulsory Competitive Tendering (CCT). Growth will increase in 1996, with all authorities undergoing CCT by early 1999.

Central government activity has compensated for this lull. Following the decision by the Inland Revenue to outsource using EDS, a number of other government departments have now outsourced IT functions, including the Department of Trade & Industry, the Home Office, and the Department of Social Security.

Network services will grow by 15% to \$3.7 billion by the end of the decade. The U.K. market is particularly advanced due to the deregulation of the telecommunications and cable TV industries and the influence of the City of London's demands for global financial services.

## Leading Software and Services Vendors

The following table (Exhibit 3) notes the U.K.'s leading software and services vendors. The table offers a ranking, the vendor's name and country of origin, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time the European information services competitive analysis was performed.



Exhibit 3

Leading Software and Services Vendors—U.K., 1994

| Ranking | Company Name            | Country of Origin | Market Share (%) |
|---------|-------------------------|-------------------|------------------|
| 1       | IBM                     | United States     | 9.4              |
| 2       | ICL                     | U.K./Japan        | 8.1              |
| 3       | Digital Equipment Corp. | United States     | 4.6              |
| 4       | Reuters                 | United Kingdom    | 3.6              |
| 5       | EDS                     | United States     | 3.0              |
| 6=      | Sema                    | France            | 2.9              |
| 6=      | Hoskyns                 | France            | 2.9              |
| 8       | Andersen Consulting     | United States     | 2.8              |
| 9       | AT&T                    | United States     | 2.4              |
| 10      | ACT                     | United Kingdom    | 1.8              |

Source: INPUT

IT Spending

The following table (Exhibit 4) offers INPUT’s estimate of IT spending in the U.K.. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending.

Both dollar amounts (in U.S.\$ billions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and identified in the following section, Forecast Database.

## Exhibit 4

## 1995 IT Spending—U.K.

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 2,800                               | 7                      |
| Internal Staff           | 9,200                               | 23                     |
| Equipment                | 5,000                               | 13                     |
| Equipment Services       | 3,700                               | 9                      |
| Facilities               | 3,900                               | 10                     |
| Information Services     | 15,000                              | 38                     |
| <b>Total IT Spending</b> | <b>39,600</b>                       | <b>100</b>             |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for the U.K., for the period 1995-2000.

## Exhibit 5

### Information Services Market United Kingdom, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 13,600     | 10%              | 15,000     | 16,700     | 18,300     | 20,000     | 21,900     | 23,800     | 10%            |
| <b>Professional Services</b>    | 3,100      | 3%               | 3,200      | 3,300      | 3,300      | 3,400      | 3,400      | 3,500      | 2%             |
| - IS Consulting                 | 700        | 10%              | 770        | 860        | 930        | 1,030      | 1,130      | 1,240      | 10%            |
| - Education & Training          | 310        | 5%               | 330        | 350        | 370        | 390        | 420        | 440        | 6%             |
| - Software Development          | 2,000      | -2%              | 2,000      | 1,900      | 1,900      | 1,800      | 1,700      | 1,500      | -5%            |
| - Application Management        | 70         | 33%              | 94         | 117        | 149        | 188        | 227        | 266        | 23%            |
| <b>Systems Integration</b>      | 1,370      | 14%              | 1,560      | 1,790      | 2,060      | 2,350      | 2,650      | 3,030      | 14%            |
| - Equipment                     | 340        | 5%               | 360        | 360        | 390        | 420        | 420        | 480        | 6%             |
| - Applications Software         | 247        | 20%              | 296        | 377        | 474        | 563        | 717        | 847        | 23%            |
| - Systems Software              | 95         | 15%              | 110        | 125        | 144        | 164        | 186        | 211        | 14%            |
| - Professional Services         | 640        | 16%              | 750        | 860        | 970        | 1,080      | 1,190      | 1,330      | 12%            |
| - Other                         | 41         | 15%              | 47         | 72         | 83         | 117        | 133        | 152        | 26%            |
| <b>Outsourcing</b>              | 1,250      | 28%              | 1,600      | 2,020      | 2,440      | 2,910      | 3,410      | 3,900      | 20%            |
| - Platform Operations           | 340        | 11%              | 380        | 440        | 470        | 520        | 560        | 590        | 9%             |
| - Applications Operations       | 770        | 35%              | 1,030      | 1,350      | 1,680      | 2,030      | 2,430      | 2,790      | 22%            |
| - Desktop Services              | 133        | 29%              | 172        | 227        | 282        | 352        | 423        | 509        | 24%            |
| <b>Processing Services</b>      | 890        | 7%               | 950        | 980        | 1,030      | 1,080      | 1,130      | 1,200      | 5%             |
| - Transaction Processing        | 670        | 5%               | 700        | 700        | 730        | 740        | 750        | 770        | 2%             |
| - Utility Processing            | 20         | 0%               | 20         | 20         | 20         | 20         | 20         | 20         | 0%             |
| - Other Processing              | 200        | 16%              | 230        | 250        | 280        | 320        | 360        | 410        | 12%            |
| <b>Network Services</b>         | 1,580      | 16%              | 1,830      | 2,120      | 2,450      | 2,820      | 3,250      | 3,700      | 15%            |
| - Electronic Information Svcs   | 1,020      | 12%              | 1,140      | 1,280      | 1,420      | 1,560      | 1,710      | 1,830      | 10%            |
| - Network Applications          | 420        | 26%              | 530        | 670        | 840        | 1,040      | 1,260      | 1,530      | 24%            |
| - Network Management            | 140        | 11%              | 160        | 170        | 200        | 230        | 270        | 340        | 17%            |
| <b>Applications SW Products</b> | 1,300      | 15%              | 1,500      | 1,800      | 2,100      | 2,200      | 2,500      | 2,600      | 12%            |
| - Mainframe                     | 100        | -5%              | 90         | 90         | 80         | 80         | 70         | 70         | -5%            |
| - Minicomputer                  | 340        | 9%               | 380        | 400        | 430        | 460        | 490        | 530        | 7%             |
| - Workstation/PC                | 800        | 20%              | 1,000      | 1,400      | 1,600      | 1,700      | 1,900      | 2,000      | 15%            |
| <b>Systems SW Products</b>      | 2,000      | 8%               | 2,100      | 2,300      | 2,400      | 2,500      | 2,600      | 2,700      | 5%             |
| - Mainframe                     | 780        | -5%              | 740        | 700        | 670        | 640        | 610        | 560        | -6%            |
| - Minicomputer                  | 630        | 10%              | 690        | 740        | 780        | 820        | 860        | 910        | 6%             |
| - Workstation/PC                | 550        | 24%              | 680        | 880        | 950        | 1,010      | 1,130      | 1,210      | 12%            |
| <b>Turnkey Systems</b>          | 2,140      | 6%               | 2,270      | 2,370      | 2,500      | 2,720      | 2,900      | 3,140      | 7%             |
| - Equipment                     | 1,060      | 5%               | 1,120      | 1,170      | 1,230      | 1,310      | 1,380      | 1,450      | 5%             |
| - Applications Software         | 360        | 11%              | 400        | 410        | 430        | 490        | 520        | 590        | 8%             |
| - Systems Software              | 180        | 4%               | 188        | 203        | 219        | 235        | 258        | 274        | 8%             |
| - Professional Services         | 530        | 6%               | 560        | 590        | 630        | 690        | 750        | 830        | 8%             |

Numbers are rounded.

Source: INPUT









# Worldwide

## Information Services Program

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REGIONAL PROFILE

LATIN AMERICA

## Latin America

September 1996

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### Geographic Area Definition

The Latin American region consists of Argentina, Brazil and Venezuela (for which separate country profiles are written), and the smaller Latin economies, including Panama, El Salvador, Guatemala, Honduras, Costa Rica, Uruguay, Paraguay, Peru, Bolivia, Colombia and Chile. A "country grouping" profile, *Other Latin America*, covering these countries as a group, is also published by INPUT as part of its *Worldwide Information Services Program*. Mexico is not included in the Latin American Region. As a result of NAFTA, Mexico, the United States and Canada share many common economic and trade interests. INPUT groups these three countries together in the North American Region, and has published separate profiles for each of them and for the region.

### Economic Overview

More and more Latin American countries are developing relatively stable political and economic environments. As a result of this stability, both business and economic growth is becoming a reality. One example of such growth is the number of bilateral, multilateral, or other free trade agreements that have been established in Latin America since the beginning of the decade. According to the Inter-American Development Bank, 27 such agreements have been entered into in the last seven years. They include:

- **MERCOSUR** - Also known as the South American Common Market (its Spanish acronym is Mercosur), this pact between Argentina, Brazil, Paraguay, and Uruguay provides for duty-free trade for almost 9,000 products.
- **The ANDEAN PACT** - This agreement was originally established in 1969, but was reinvigorated in 1994 when Colombia, Venezuela and Ecuador established a common customs union. Exports from the three nations were \$3.4 billion in 1994, the latest time for which this data is available.

- **CARICOM** - Also known as the Caribbean Economic Community, this country grouping includes 14 nations and was established in 1973. In 1994, exports reached more than \$500 million—a surprising amount for economies better known for their tourist revenues. Free trade agreements between CARICOM countries and Colombia, Mexico and Venezuela have been established, expanding the economic influence of this pact.

Because it affects the area defined by INPUT as North America, the North American Free Trade Agreement (NAFTA) is not included here. The omission is significant, since NAFTA defines the largest free trade market in the world, a market that accounts for 80% or more of the trade in the Western Hemisphere. To offer a feel for the magnitude of the trading area, the NAFTA market contains almost 400 million people. NAFTA is important to Latin America, however, because when combined with MERCOSUR, the ANDEAN PACT, and CARICOM, it provides the foundation for a comprehensive Western Hemisphere trading community now being called the Free Trade Area of the Americas—or simply FTAA. The FTAA, a sweeping economic plan for the Americas, is now being studied by trade ministers from 34 Western Hemisphere countries in Cartagena, Colombia, with hope of implementing a comprehensive program by 2005. If implemented, business and economic growth for all participants can be expected to improve—even beyond current optimistic projections. Even if final agreement on the terms of the FTAA is delayed, however, overall trade growth for the Latin American nations is estimated to have grown by 15% in 1995, and equivalent growth is projected for the future.

A table of consolidated GDP growth and inflation rates, unemployment figures, and exchange rates is not included in this regional profile, since consolidations of such figures for smaller economies tend to produce data of questionable statistical value. Specific data for Argentina, Brazil, Chile, and Venezuela is included in Exhibit 1, however, as examples of the economic performance of the strongest economies in this region.

Exhibit 1

1995 Key Economic Indicators—Latin America

| Country   | GDP Growth Rate |       | Inflation Rate | Unemploy-ment Rate | Exchange Rate |
|-----------|-----------------|-------|----------------|--------------------|---------------|
|           | 1995            | 1996  |                |                    |               |
| Argentina | -2.0%           | 2.1%  | 2.1%           | 12.0% (1994)       | 1.00          |
| Brazil    | 4.2%            | 3.0%  | 11.5%          | 4.9% (1993)        | 1.01          |
| Chile     | 8.4%            | 6.7%  | 6.0%           | 6.0% (1994)        | 410.15        |
| Venezuela | 2.2%            | -0.5% | 56.6%          | 9.0% (1994)        | 466.5         |

Sources: GDP and Inflation - BofA World Information Services, 1996  
CIA World Factbook, 1995  
Exchange Rate: Wall Street Journal, 6/96

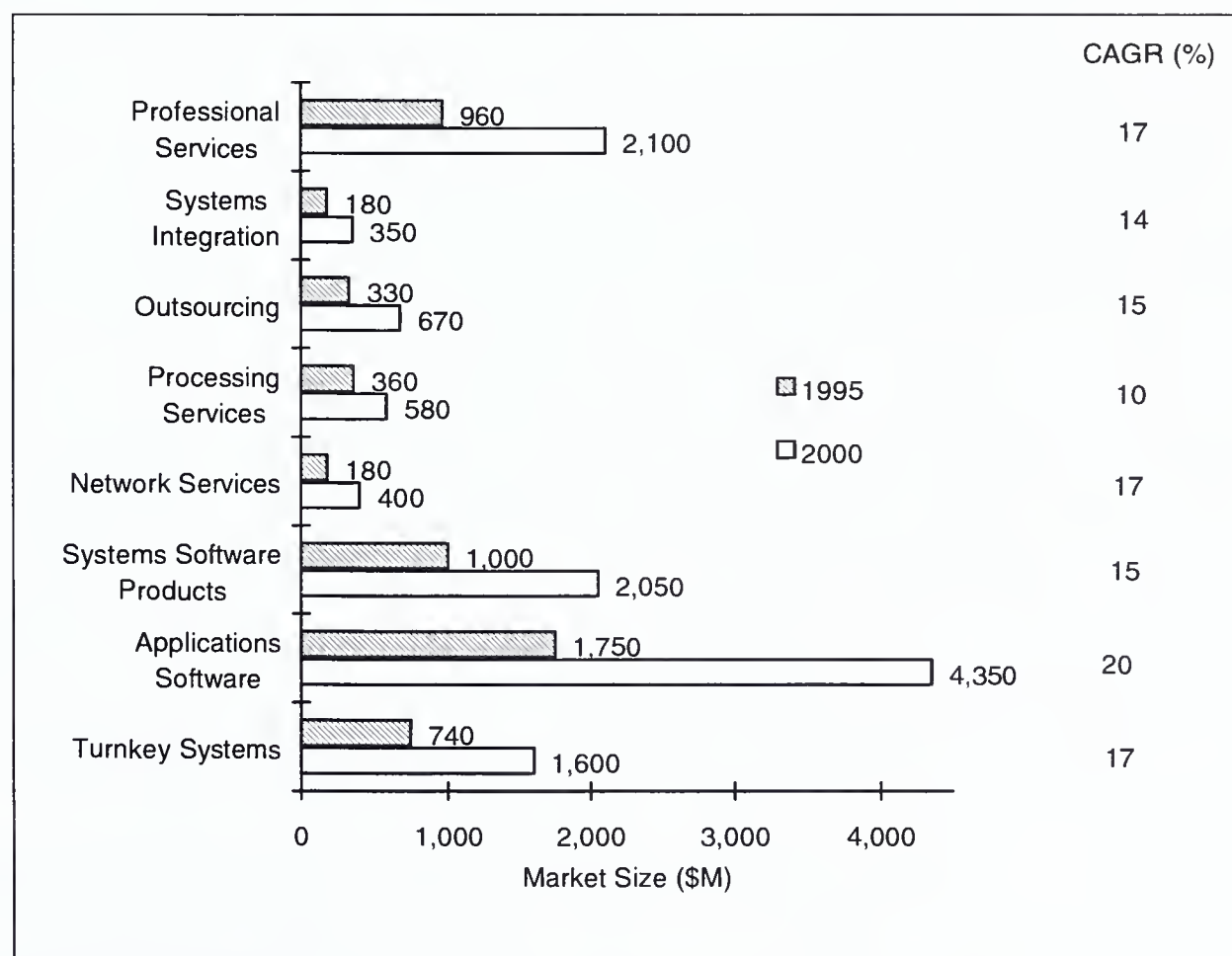
The GDP growth assumptions in Exhibit 1 are for the years indicated, while the inflation rate assumptions are averages for the period 1995-2000, except for Brazil, where the average period is 1996-2000. Unemployment numbers are the latest available, for the year indicated, and do not take into account *underemployment*, a common condition in Latin America. Exchange rates are in units of local currency to purchase one U.S. dollar. Sources for this data are noted in the footnotes to the table.

## Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category**  
**Latin America, 1995 - 2000**



Numbers are rounded.

Source: INPUT



INPUT forecasts that the Latin American regional market for information services will grow over the next five years at a rate of 17% per annum—from more than \$5.5 billion in 1995 to just over \$12.1 billion in 2000. This growth is being driven by increased usage in almost all information services areas, but is the result of the particularly strong 1995-2000 performance of applications software products (a 20% compound annual growth rate—CAGR), professional services (17% CAGR), network services (17%) and turnkey systems (17%).

The largest product/service market sectors, software products and professional services, are being driven by strong growth in Argentina, Brazil, and Chile (Other Latin America). Brazil especially, is a strong market and overall represents over 50% of the spending for these products and services in both 1995 and 2000. Brazil's use of information services, overall, represents slightly more than 46% of total Latin American spending in 1995, and slightly more than 45% in 2000. Argentina's percentages for the same two years are 17% and 18%. Other Latin American spending for information services will grow from 25% in 1995 to more than 29% of total Latin American spending in 2000, while Venezuela's portion of this market will slip from 12% to 8%. These growth patterns reflect the economic dynamics of their respective countries or country groupings, and are summarized in the table (Exhibit 3) below.

Exhibit 3

Country or Country Grouping Percentages of Total Latin American Information Services Market, 1995 and 2000

| Country                        | Market Share - 1995 | Market Share - 2000 |
|--------------------------------|---------------------|---------------------|
| Argentina                      | 46%                 | 45%                 |
| Brazil                         | 17%                 | 18%                 |
| Venezuela                      | 12%                 | 8%                  |
| Other Latin American Countries | 25%                 | 29%                 |

Source: INPUT

Exhibit 4 notes the 1994-1995 growth rates for total information services spending for the countries indicated, followed by the five-year CAGRs for the period 1995-2000. Argentina and the Other Latin American countries will experience a 1% increase in growth during the forecast period, reflecting the overall improvements in their economies and business environment. Venezuela's economic problems are expected to continue, and their impact on information services spending is noted by a 2% drop from current spending levels. Brazil's growth will improve by 2%—a direct result of the continuing improvements in that country's economic and business climate. If current trends improve even more, the growth rate may increase by as much as an additional 1% to 2%.

## Exhibit 4

**Country or Country Grouping Growth Percentages  
Information Services Market, 1995 and 2000**

| Country                          | 1994-1995 Growth | 1995-2000 Growth |
|----------------------------------|------------------|------------------|
| Argentina                        | 17%              | 18%              |
| Brazil                           | 15%              | 17%              |
| Venezuela                        | 8%               | 6%               |
| "Other" Latin American Countries | 20%              | 21%              |
| <b>Latin American Region</b>     | 15%              | 17%              |

Source: INPUT

The fundamental strength of the combined Latin American economies is shown in the regional performance—the 1995 growth of 15% improves to 17% for the forecast period. Turnkey systems spending continues at an aggressive rate, although the base for this market is small. Turnkey solutions are popular in areas such as accounting and manufacturing, since they generally offer a cost-effective packaged answer to a specific business need. The systems integration and outsourcing markets are relatively small at this time, but both will see good growth during the forecast period as more firms seek technical and operational support in dealing with the growing complexity of the IT environment. Implementing or changing to a client/server architecture or a network-centric computing environment, for instance, require skills and resources that will be most cost effectively provided by information services vendors.

Network services are currently restrained by the availability of a sophisticated telecommunications infrastructure with which to access them. In virtually all Latin American countries, however, improving, updating, and expanding communications networks are key government initiatives, and with the added impetus of privatization and the potential of the Internet, the telecommunications environment will improve and related network services spending will grow at a 17% CAGR for the forecast period. Processing services five-year growth is a relatively modest 10%, lowest for all information services/product categories for this region, but still showing the value of usage-sensitive resources in growing economies.

## Leading Software and Services Vendors

The following table (Exhibit 5) notes a representative selection of major Latin American software and services vendors. The listing is representative and is not intended to identify all major vendors. The exhibit indicates whether the primary information services offerings are software, services, or both.

Exhibit 5

**Selected Software and Services Vendors—Latin America, 1995**

| Company Name                | Provides |          |
|-----------------------------|----------|----------|
|                             | Services | Software |
| IBM                         | X        | X        |
| Digital                     | X        | X        |
| Grupo Ingedigit (Venezuela) | X        | X        |
| MANAPRO C.A. (Venezuela)    | X        | X        |
| Solaris (Brazil)            | X        | X        |
| Andersen Consulting         | X        |          |
| EDS                         | X        |          |
| Brasoft (Brazil)            |          | X        |
| Datatech SA (Argentina)     |          | X        |
| Informix                    |          | X        |
| Microsoft                   |          | X        |
| Novell                      |          | X        |
| Oracle                      |          | X        |
| Sonda (Chile)               |          | X        |
| Sybase                      |          | X        |

Source: INPUT

# IT Spending

The following table (Exhibit 6) offers INPUT’s estimate of IT spending for Latin America. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product or service.

## Exhibit 6

## 1995 IT Spending—Latin America

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 1,400                               | 5%                     |
| Internal Staff           | 7,800                               | 28%                    |
| Equipment                | 7,050                               | 25%                    |
| Equipment Services       | 2,850                               | 10%                    |
| Facilities               | 3,500                               | 12%                    |
| Information Services     | 5,550                               | 20%                    |
| <b>Total IT Spending</b> | <b>28,150</b>                       | <b>100%</b>            |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for Latin America, for the period 1995-2000.

## Exhibit 7

Information Services Market  
Latin America, 1995-2000

| PRODUCT/SERVICE<br>CATEGORIES   | 1994<br>(\$M) | Growth<br>94-95<br>(%) | 1995<br>(\$M) | 1996<br>(\$M) | 1997<br>(\$M) | 1998<br>(\$M) | 1999<br>(\$M) | 2000<br>(\$M) | CAGR<br>95-00<br>(%) |
|---------------------------------|---------------|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------|
| <b>REGIONAL TOTAL</b>           | 4,763         | 15%                    | 5,501         | 6,364         | 7,401         | 8,699         | 10,251        | 12,104        | 17%                  |
| <b>Professional Services</b>    | 818           | 17%                    | 955           | 1,105         | 1,282         | 1,506         | 1,789         | 2,123         | 17%                  |
| <b>Systems Integration</b>      | 164           | 11%                    | 182           | 204           | 232           | 266           | 302           | 345           | 14%                  |
| <b>Outsourcing</b>              | 289           | 15%                    | 331           | 379           | 435           | 502           | 578           | 670           | 15%                  |
| <b>Processing Services</b>      | 334           | 8%                     | 360           | 389           | 423           | 469           | 522           | 582           | 10%                  |
| <b>Network Services</b>         | 160           | 13%                    | 180           | 210           | 245           | 290           | 340           | 400           | 17%                  |
| <b>Applications SW Products</b> | 1,487         | 18%                    | 1,759         | 2,082         | 2,487         | 2,996         | 3,609         | 4,356         | 20%                  |
| <b>Systems SW Products</b>      | 870           | 15%                    | 997           | 1,145         | 1,314         | 1,520         | 1,759         | 2,037         | 15%                  |
| <b>Turnkey Systems</b>          | 641           | 15%                    | 737           | 850           | 983           | 1,150         | 1,352         | 1,591         | 17%                  |

Source: INPUT







# Worldwide

## Information Services Program

COUNTRY PROFILE

LATIN AMERICA

## Argentina

September 1996

### Economic Overview

President Carlos Saul Menem's government seems to have Argentina well on the road to not just recovery (after years of high inflation rates, poor fiscal management by the government and an uncertain business environment)—he has also positioned the country for a period of sustained growth. In 1994, inflation was reduced from a four-digit level to only 3.9%, with rates through 2000 expected to average 2.1% (see Exhibit 1). Fiscal controls have been restored, resulting in a reduction in the foreign borrowing that has contributed to government deficits in the past. A strong privatization program has resulted in the government selling or closing many enterprises previously owned by the state. As a result, the national airline, the telephone company, and many of the railroads are now privately operated. Supporting the privatization program have been strong efforts by the government to attract foreign investment and a climate encouraging more liberalized foreign trade. The government has also benefited from a restructuring of the Argentine tax system and a major reduction in employment in the public sector. In fact, at the end of 1994, more than 700,000 public sector workers were either transferred to private firms or local governments, retired, or fired.

Argentina's economic resurgence has not been an uneventful, steady, smooth progression. Mexico's 1994 peso crisis produced a major reaction in Argentina (known as the "tequila effect"), but the Menem government reacted quickly and decisively—raising taxes and cutting government spending—minimizing the impact on Argentina's economy. There have been lingering effects—for instance, a decline of 2% in gross domestic product in 1995—but these were the expected results of the controls applied in 1994, and GDP growth is expected to return in 1996 (see Exhibit 1).

Like Canada, Argentina is a country rich in natural resources and human potential. Its adult population is 96% literate, the country generates enough energy to meet its needs, the "Pampas" is one of the world's most fertile agricultural regions, and it has a well-developed industrial base. The business environment, as a result of the

government’s efforts to improve the economy, is also expected to continue to improve. Multinationals will continue their expansion into Argentina as a result of continuing privatization efforts and the emergence of new markets, and the opportunities represented by the dynamic Southern Cone Common Market (Mercosur). Argentine companies will also benefit from both an increase in consumer demand and a continuing growth in exports—especially to Mercosur countries, which will consume almost \$8 billion in Argentine exports or about 35% of Argentina’s total exports in 1996. Exhibit 1 summarizes some key economic indicators.

Exhibit 1

Key Economic Indicators—Argentina

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | -2.0% |
| - 1996                     | 2.1%  |
| Inflation Rate (1995-2000) | 2.1%  |
| Unemployment Rate          | 12.0% |
| Exchange Rate              | 1.00  |

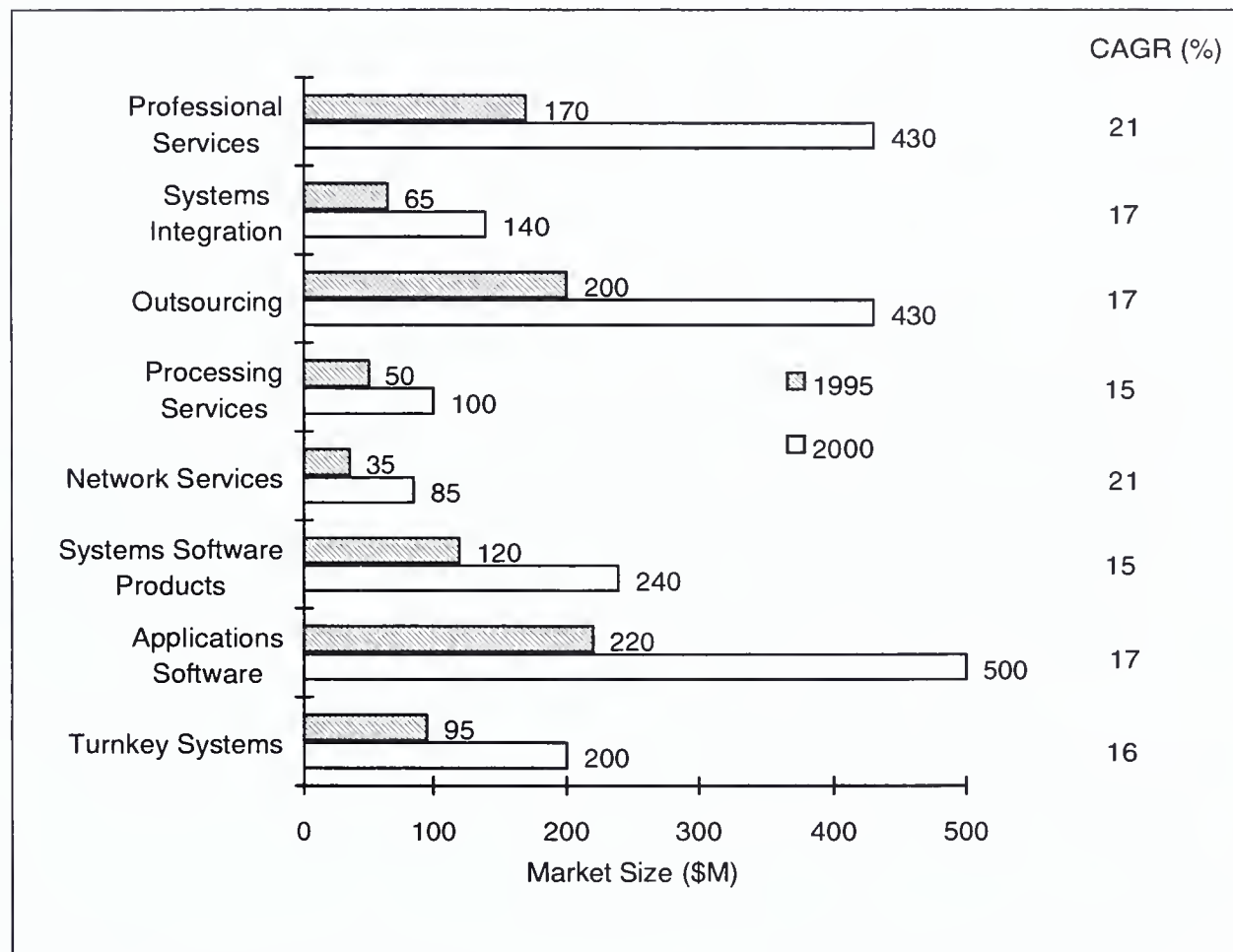
Sources: GDP and Inflation Data, Bank of America, 1996  
Exchange Rates, Wall Street Journal, 6/96  
Unemployment Rates, CIA Factbook, 1995

Information Services Market Forecast

Exhibit 2 summarizes INPUT’s market forecast for Argentina for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

## Exhibit 2

### Market Forecast by Product/Service Category Argentina, 1995 - 2000



Numbers are rounded.

Source: INPUT

INPUT sizes the information services market in Argentina at almost \$950 million in 1995, growing to more than \$2.1 billion by 2000 at a compound annual growth rate (CAGR) of 18%. This overall growth rate is the same as INPUT's prior estimate of 1994-1999 growth, and reflects the continuing steady performance of the Argentine economy.

Professional services spending is growing, reflecting the increased demand for both software development and training—especially for PC-based applications—being driven by Argentina's improved economic growth. As with professional services, systems integration activities are also increasing, up 2-3% from 1994 projections. Equipment and software products are the major growth areas, reflecting the increased demand of the country's businesses for updated or new systems to replace the older platforms and production environments that are the legacy of earlier periods of economic restriction, high rates of inflation, and limited product availability.



The base for outsourcing spending for both platform and applications operations has been significantly increased to reflect recently identified revenues received by major U.S. corporations providing outsourcing services in Argentina, although five-year growth rates remain the same. Outsourcing continues to be a major means of cost control for larger Argentinean businesses (see *Market Segmentation*, below), allowing them to concentrate on core business activities. Processing services spending is up slightly, as cost-effective, “pay-as-you-go” transaction processing services are used in tandem with outsourcing to contain costs and improve profits.

The 1990 privatization of Argentina’s telecommunications network, ENTEL, created two regional telephone companies, Telecom and Telefonica, the former owned by France Telecom and STET (Italy) and the latter by Spain’s Telefonica de Espana. Both are actively deploying networks and the more stable Argentine regulatory environment is creating new markets for network services, such as private networks and value-added communications resources. As a result of the improved telecommunications infrastructure and better business and economic performance, the growth in spending for network services is up to 21% for the five-year forecast period. The more sophisticated communications environment also offers greater opportunity for new application areas, such as Internet-based activities.

The applications and systems software markets are growing at five-year rates of 17% and 15%, respectively. Driving this growth is the steady migration of larger users away from large centralized processing environments toward more cost-effective network-centric client/server architectures. The result is that the strongest growth is in the market for workstation/PC-based software products. The largest demand for such products is coming from large and medium-sized companies.

The growth in the market for turnkey systems will decrease from 18% in 1995 to a CAGR of 16% for the period 1995-2000. Driving this change is the appearance of more general-purpose workstations and PCs capable of performing many of the traditional turnkey applications and also other tasks. Supporting the continued growth of this product/service category are turnkey applications in such growing areas as the automotive industry and the health care testing and analysis market.

### *Market Segmentation*

According to a U.S. Department of Commerce analysis, Argentina’s businesses can be segmented into three broad categories, according to either the number of employees, or the size of annual sales. This segmentation is summarized in Exhibit 3.

## Exhibit 3

**Argentina - Market Segmentation**

| Size   | Number of Firms | Size Definition                    |
|--------|-----------------|------------------------------------|
| Large  | 30              | 1,000 employees or more            |
| Medium | 1,000           | Annual sales over \$5 million      |
| Small  | 200,000         | Annual sales less than \$5 million |

*Source: U.S. Department of Commerce, 1996*

The most attractive market for information services vendors will be the medium-sized firms—those with annual sales of \$5 million or more. The smaller firms have limited resources, and although they use information services and software products are not likely candidates for major outsourcing, systems integration, or professional services contracts. The 30 largest firms represent a very limited market that, due to its size and position in the economic hierarchy, already has established information services relationships; although, as company needs change, these relationships may also change.

Argentina occupies an advantageous position as a gateway to the growing Southern Cone Market area, which includes Brazil, Uruguay, and Paraguay. Argentina's fastest growing industries include automotive, financial services (insurance and pension funds), chemicals (process manufacturing), agriculture, and health services. The chemical and agricultural industries, especially, require substantial modernization to be competitive in world markets.

## Leading Software and Services Vendors

The following table (Exhibit 4) notes INPUT's estimate of Argentina's leading software and services vendors. Because revenue data for Argentina's domestic information services vendors is not available, Exhibit 5 provides a separate listing of these companies, noting if they are software or services vendors.

Exhibit 4 offers a ranking, the vendor's name, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1994 vendor revenues, the latest available at the time this analysis was performed.

Exhibit 4

Leading Software and Services Vendors—Argentina, 1994

| Ranking | Company Name | Market Share (%) |
|---------|--------------|------------------|
| 1       | IBM          | 21%              |
| 2       | EDS          | 6%               |
| 3=      | Microsoft    | 2%               |
| 3=      | J.D. Edwards | 2%               |
| 5=      | Oracle       | 1%               |
| 5=      | Intersoft    | 1%               |
| 5=      | SSA          | 1%               |
| 8=      | Novell       | <1%              |
| 8=      | Informix     | <1%              |
| 8=      | Lotus        | <1%              |

Source: INPUT

IBM is generally considered to provide the bulk of the software for large and mid-range (e.g., AS/400) systems in Argentina, while Microsoft is the major supplier of PC-based software products. Other software and services suppliers include Hewlett-Packard (manufacturing) and Unisys (banking). As an example of a major services contract, in 1995 EDS signed an agreement to develop an electronic banking network in Argentina from the merger of two competing networks—DataCash and NewNet. EDS will provide systems development and integration and management of applications and processes as part of the 5+ year agreement.

*A Cautionary Note for Software Products Vendors -* The U.S. Department of Commerce, International Trade Administration, in an April 30, 1996 announcement, designated Argentina as one of seven *Priority Watch List* countries. This indicated that intellectual property rights (IPRs) for items such as software are not accorded “adequate and effective protection.” Although this designation is not the most serious for the violation of IPRs, it does indicate that there is a significant risk of illegal software copies being used in Argentina. Worldwide, seven countries and one regional group are identified on the *Priority Watch List*.

Exhibit 5 notes six Argentine information services companies. All of them provide software products.

## Exhibit 5

**Argentina-Based Software Companies**

| <b>Company</b>                | <b>Location</b> |
|-------------------------------|-----------------|
| Computacion Argentina S.R.L.  | Capital Federal |
| Datatech S.A.                 | Capital Federal |
| Erova S.A.                    | Capital Federal |
| Noise S.A                     | Buenos Aires    |
| Sisteco-Sistem, Computa. S.A. | Buenos Aires    |
| Siswork S.A.                  | Capital Federal |

Source: U.S. Department of Commerce

## IT Spending

The following table (Exhibit 6) offers INPUT's estimate of IT spending in Argentina. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

## Exhibit 6

**1995 IT Spending—Argentina**

| <b>Budget Category</b>   | <b>Estimated Spending<br/>(\$ Millions)</b> | <b>% of Total IT Spending</b> |
|--------------------------|---|-------------------------------|
| Data Communications      | 200   | 5                             |
| Internal Staff           | 1,150                                       | 26                            |
| Equipment                | 1,100                                       | 25                            |
| Equipment Services       | 450   | 10                            |
| Facilities               | 530   | 12                            |
| Information Services     | 950   | 22                            |
| <b>Total IT Spending</b> | <b>4,380</b>                                | <b>100</b>                    |

Numbers are rounded.

Source: INPUT



## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for Argentina, for the period 1995-2000.

Exhibit 7

### Information Services Market Argentina, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 813        | 17%              | 949        | 1,110      | 1,308      | 1,543      | 1,808      | 2,128      | 18%            |
| <b>Professional Services</b>    | 135        | 22%              | 165        | 201        | 245        | 295        | 355        | 429        | 21%            |
| - IS Consulting                 | 35         | 20%              | 42         | 50         | 60         | 70         | 85         | 100        | 19%            |
| - Education & Training          | 18         | 17%              | 21         | 26         | 30         | 35         | 40         | 49         | 18%            |
| - Software Development          | 82         | 24%              | 102        | 125        | 155        | 190        | 230        | 280        | 22%            |
| <b>Systems Integration</b>      | 55         | 15%              | 63         | 74         | 87         | 103        | 120        | 141        | 17%            |
| - Equipment                     | 15         | 13%              | 17         | 20         | 23         | 27         | 31         | 36         | 16%            |
| - Software Products             | 21         | 14%              | 24         | 28         | 34         | 40         | 48         | 57         | 19%            |
| - Professional Services         | 17         | 18%              | 20         | 23         | 27         | 32         | 37         | 44         | 17%            |
| - Other                         | 2          | 6%               | 2          | 3          | 3          | 4          | 4          | 4          | 15%            |
| <b>Outsourcing</b>              | 170        | 17%              | 199        | 232        | 272        | 318        | 371        | 434        | 17%            |
| - Platform Operations           | 104        | 18%              | 123        | 143        | 167        | 194        | 226        | 263        | 16%            |
| - Applications Operations       | 66         | 15%              | 76         | 89         | 105        | 124        | 145        | 171        | 18%            |
| <b>Processing Services</b>      | 44         | 11%              | 49         | 56         | 65         | 75         | 86         | 99         | 15%            |
| - Transaction Processing        | 22         | 18%              | 26         | 31         | 37         | 44         | 53         | 64         | 20%            |
| - Utility Processing            | 12         | 8%               | 13         | 14         | 16         | 17         | 18         | 19         | 8%             |
| - Other Processing              | 10         | 0%               | 10         | 11         | 12         | 14         | 15         | 16         | 10%            |
| <b>Network Services</b>         | 29         | 17%              | 34         | 40         | 49         | 60         | 72         | 87         | 21%            |
| - Electronic Information Svcs   | 21         | 14%              | 24         | 28         | 35         | 43         | 52         | 63         | 21%            |
| - Network Applications          | 8          | 25%              | 10         | 12         | 14         | 17         | 20         | 24         | 19%            |
| <b>Applications SW Products</b> | 195        | 15%              | 224        | 259        | 302        | 360        | 420        | 495        | 17%            |
| <b>Systems SW Products</b>      | 105        | 14%              | 120        | 138        | 159        | 183        | 210        | 241        | 15%            |
| <b>Turnkey Systems</b>          | 80         | 19%              | 95         | 110        | 129        | 149        | 174        | 202        | 16%            |
| - Equipment                     | 40         | 18%              | 47         | 53         | 60         | 67         | 75         | 84         | 12%            |
| - Software Products             | 25         | 20%              | 30         | 36         | 43         | 51         | 61         | 72         | 19%            |
| - Professional Services         | 15         | 20%              | 18         | 21         | 26         | 31         | 38         | 46         | 21%            |

Source: INPUT



# Worldwide

## Information Services Program

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COUNTRY PROFILE

LATIN AMERICA

## Brazil

September 1996

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### Economic Overview

Like Latin America's other major economy—Argentina—Brazil, under president Fernando Henrique Cardoso, is experiencing strong economic growth after a prolonged period of high inflation and business instability. In 1993 Cardoso implemented a strong economic stabilization program—called, appropriately enough, the “Real Plan”—and reduced inflation from an almost unbelievable 2,500% *per year* to a manageable 23% in 1995. Figures for 1996 through 1998 are projected to decline from 14% to 11.5% and are estimated to average 11.5% for the period 1996-2000.

President Cardoso's plan, currently being implemented, has as its foundation a multi-phased monetary and fiscal program designed to establish economic stability and reduce inflation. As part of this plan, the Real, a new currency, was introduced in 1994, and programs are under way to balance the budget, provide strong monetary controls, privatize many state industries, liberalize investment policies, reform public administration and taxes, and redistribute government functions between the various levels of public administration.

Brazil's plans are aided by a broad base of agricultural, industrial, and services activities that produced more than \$0.5 trillion in gross domestic product (GDP) in 1994. Trade liberalization, in the form of reduced tariffs and the removal of many barriers to trade growth, is also helping the Brazilian economy. As an example, many tariffs in the early 1990s ran as high as 100%. Today, with a few exceptions, the highest tariffs run only 20%.

Despite Brazil's ambitious plans and demonstrated successes (e.g., reduced inflation and reduced tariffs), many observers of the Brazilian economy still remain skeptical of long-term success for current plans. This concern is based partly on the stop-and-go performance of many reforms and partly on the fact that many significant problems do not yet have clearly defined solutions. Of continuing concern are reducing the large public sector deficit, managing the large inflow of foreign capital attracted by interest disparities,

and achieving economic reform objectives within the limits of the current economic policy mix—a goal which could be jeopardized by increased pressures on those policies.

Despite these concerns, however, the Brazilian business climate is expected to continue to improve over the next few years. Major foreign companies are attracted by privatization opportunities in such industries as telecommunications and railroads, and the development of natural resources such as oil and gas production and mining. Brazilian firms are responding to foreign competition by restructuring to improve efficiencies and reduce costs. Restructuring activities include mergers, acquisitions, and downsizing. Overall, the business climate is one of cautious optimism—a reaction based upon the considerable economic and business progress already achieved.

Exhibit 1 summarizes key economic indicators for Brazil.

Exhibit 1

Key Economic Indicators—Brazil

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 4.2%  |
| - 1996                     | 3.0%  |
| Inflation Rate (1996-2000) | 11.5% |
| Unemployment Rate (1993)   | 4.9%  |
| Exchange Rate              | 1.01  |

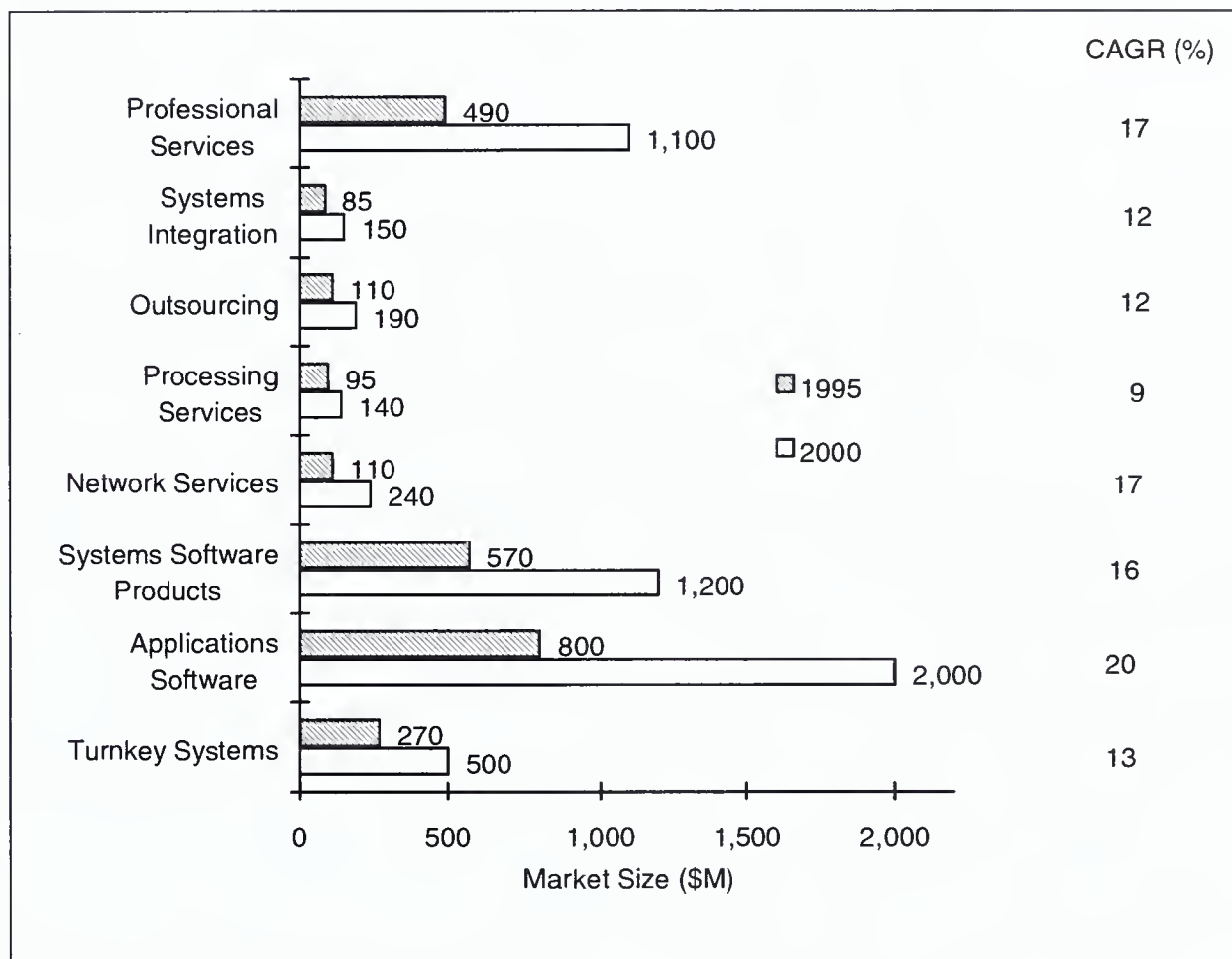
Sources: GDP and Inflation Data, Bank of America, 1996  
Exchange Rates, Wall Street Journal, 6/96  
Unemployment Rates, CIA Factbook, 1995

Information Services Market Forecast

Exhibit 2 summarizes INPUT’s market forecast for Brazil for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2

**Market Forecast by Product/Service Category  
Brazil, 1995 - 2000**



Numbers are rounded

Source: INPUT

INPUT sizes the information services market in Brazil at more than \$2.5 billion in 1995, growing to over \$5.5 billion by the year 2000, at a compound annual growth rate (CAGR) of 17%. This overall growth rate is the same as INPUT's prior estimate of 1994-1999 growth, and reflects the continuing steady performance of the Brazilian economy.

Driven by the restructuring activities of Brazilian businesses, professional services continues to grow at a 17% CAGR for the forecast period, while systems integration (SI) spending growth is up a percentage point, at 12% for the period 1995-2000, and outsourcing growth is up by one-third at 12% for the forecast period. Software development continues as a strong professional services activity, and other than software products, is the largest category of information services spending throughout the forecast period. Change—both for native companies and foreign firms entering the Brazilian market—is the catalyst for increases in professional services, SI, and outsourcing spending. Cost containment, expense reduction, and improved operational efficiencies are all normal competitive responses by



Brazilian businesses to increased foreign competition and the country's improved, more aggressive business climate.

Processing services growth will continue at a steady 9%, with slightly stronger emphasis on cost-effective (pay-as-you-go) transaction processing services.

Network services, especially those related to the increased availability of rich on-line information bases such as the Internet, will grow at an aggressive 17% rate during the forecast period. Internet acceptance in Brazil is quite strong, with more than 300 businesses offering access to nearly 150,000 local sites in 1995. Telebras, the Brazilian state-owned telecommunications company, is seeking to improve the telecommunications infrastructure of the country through a series of project-specific partnerships with foreign investors. Such projects include a "turnkey" initiative to link 1,000 small earth stations in the Amazon basin with the rest of the country at a cost of approximately \$200 million. A major long-range benefit of these improvements to the telecommunications infrastructure is the increased opportunity for and use of information services.

Growth of systems and applications software continues at a strong 16% and 20%, respectively, for the forecast period—unchanged from the prior forecast. As with virtually all the country processing environments, the primary platform for software purchases will be the workstation/PC. Also as in many countries, however, software piracy in Brazil is a major concern. Although Brazil does not appear on the current U.S. Department of Commerce *Priority Watch List*, one estimate notes that, in Brazil, for every legal copy of software sold, there are as many as four illegal copies!

Turnkey systems growth will be off slightly, at 13% for 1995-2000, with slight reductions in spending for both equipment and software as companies seek more flexible solutions to applications needs. Overall, however, growth is still at a very respectable level for the forecast period.

*Brazilian Software Development Objectives* - Since 1992, local production and exportation of software has been stimulated and encouraged by the Brazilian government. In fact, Brazil's official software development program, *Software 2000*, has as its primary objective that Brazil provide 1% of global software product needs by that year. If Brazil is successful in this endeavor, software will become its most important export. Competing with Brazil, however, are other offshore (non-U.S.) software development powers such as India and the Philippines. INPUT estimates that, worldwide, offshore software development will grow from a \$1.5 billion market in 1995 to more than \$10.5 billion in 2000. Growth from 1995 to 1998 will be at a very aggressive 40%, but will escalate to 60% toward the millennium. Competing with Brazil will be countries such as India, with 500 software development firms

today and 32,000 professionals, and the Philippines, with 100 software development firms, 90% of whose activity is for export.

## Leading Software and Services Vendors

Exhibit 3 offers a selection of Brazil's major information services vendors. It notes the vendor's name, identifies the major categories of support provided (software or services), and, for software product companies, offers INPUT's estimate of the percentage of the Brazilian software products market that the vendor holds, based upon 1995 revenues. Because current, accurate revenue data for Brazil's domestic information services vendors is not available, a separate representative list of Brazilian companies, showing name and area of activity, is provided in Exhibit 4.

Exhibit 3

### Selected Software and Services Vendors—Brazil, 1995

| Company Name        | Provides<br>Services   Software | Percent of<br>Software Market |
|---------------------|---------------------------------|-------------------------------|
| IBM                 | X X                             | 12%                           |
| EDS                 | X                               | -                             |
| Andersen Consulting | X                               | -                             |
| Microsoft           | X                               | 4%                            |
| Sybase              | X                               | 3%                            |
| Computer Associates | X                               | 2%                            |
| Oracle              | X                               | 2%                            |
| Novell              | X                               | 1%                            |
| SSA                 | X                               | 1%                            |
| Informix            | X                               | 1%                            |

Source: INPUT

Exhibit 4 notes three Brazilian information services companies and identifies the products or services that they provide.

Exhibit 4

### Examples of Brazil-Based Information Services Companies

| Company        | Product or Service                              |
|----------------|---|
| Solaris        | Systems integrator; technical support; software |
| Brasoft        | Software products                               |
| CI-Compucenter | Software products                               |

Source: U.S. Department of Commerce

IT Spending

The following table (Exhibit 5) offers INPUT’s estimate of IT spending in Brazil. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

Exhibit 5

1995 IT Spending—Brazil

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 750                              | 6                      |
| Internal Staff       | 3,450                            | 27                     |
| Equipment            | 3,200                            | 25                     |
| Equipment Services   | 1,300                            | 10                     |
| Facilities           | 1,550                            | 12                     |
| Information Services | 2,550                            | 20                     |
| Total IT Spending    | 12,800                           | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 6) for Brazil, for the period 1995-2000.

## Exhibit 6

**Information Services Market  
Brazil, 1995-2000**

| <b>PRODUCT/SERVICE CATEGORIES</b> | <b>1994 (\$M)</b> | <b>Growth 94-95 (%)</b> | <b>1995 (\$M)</b> | <b>1996 (\$M)</b> | <b>1997 (\$M)</b> | <b>1998 (\$M)</b> | <b>1999 (\$M)</b> | <b>2000 (\$M)</b> | <b>CAGR 95-00 (%)</b> |
|-----------------------------------|-------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|
| <b>COUNTRY TOTAL</b>              | 2,202             | 15%                     | 2,533             | 2,929             | 3,400             | 3,989             | 4,697             | 5,530             | 17%                   |
| <b>Professional Services</b>      | 422               | 17%                     | 492               | 568               | 656               | 770               | 920               | 1,092             | 17%                   |
| - IS Consulting                   | 124               | 19%                     | 148               | 175               | 208               | 247               | 292               | 352               | 19%                   |
| - Education & Training            | 61                | 13%                     | 69                | 78                | 89                | 105               | 123               | 140               | 15%                   |
| - Software Development            | 237               | 16%                     | 275               | 315               | 359               | 418               | 505               | 600               | 17%                   |
| <b>Systems Integration</b>        | 80                | 9%                      | 87                | 97                | 109               | 122               | 135               | 150               | 12%                   |
| - Equipment                       | 30                | 7%                      | 32                | 34                | 37                | 41                | 45                | 50                | 9%                    |
| - Software Products               | 6                 | 0%                      | 6                 | 7                 | 7                 | 8                 | 8                 | 9                 | 8%                    |
| - Professional Services           | 42                | 12%                     | 47                | 54                | 62                | 70                | 78                | 87                | 13%                   |
| - Other                           | 2                 | 0%                      | 2                 | 2                 | 3                 | 3                 | 4                 | 4                 | 15%                   |
| <b>Outsourcing</b>                | 102               | 10%                     | 112               | 124               | 138               | 154               | 172               | 194               | 12%                   |
| - Platform Operations             | 56                | 9%                      | 61                | 68                | 76                | 84                | 94                | 105               | 11%                   |
| - Applications Operations         | 46                | 11%                     | 51                | 56                | 62                | 70                | 78                | 89                | 12%                   |
| <b>Processing Services</b>        | 88                | 7%                      | 94                | 103               | 110               | 120               | 131               | 143               | 9%                    |
| - Transaction Processing          | 39                | 10%                     | 43                | 49                | 55                | 62                | 71                | 80                | 13%                   |
| - Utility Processing              | 31                | 3%                      | 32                | 33                | 33                | 34                | 34                | 35                | 2%                    |
| - Other Processing                | 18                | 6%                      | 19                | 21                | 22                | 24                | 26                | 28                | 8%                    |
| <b>Network Services</b>           | 98                | 12%                     | 110               | 129               | 149               | 175               | 204               | 238               | 17%                   |
| - Electronic Information Svcs     | 83                | 12%                     | 93                | 109               | 127               | 149               | 174               | 204               | 17%                   |
| - Network Applications            | 15                | 13%                     | 17                | 20                | 22                | 26                | 30                | 34                | 15%                   |
| <b>Applications SW Products</b>   | 678               | 18%                     | 803               | 950               | 1,140             | 1,380             | 1,670             | 2,020             | 20%                   |
| <b>Systems SW Products</b>        | 497               | 15%                     | 570               | 658               | 759               | 883               | 1,027             | 1,194             | 16%                   |
| <b>Turnkey Systems</b>            | 237               | 12%                     | 265               | 300               | 339               | 385               | 438               | 499               | 13%                   |
| - Equipment                       | 90                | 7%                      | 96                | 104               | 112               | 121               | 131               | 141               | 8%                    |
| - Software Products               | 84                | 17%                     | 98                | 115               | 134               | 156               | 181               | 209               | 16%                   |
| - Professional Services           | 63                | 13%                     | 71                | 81                | 93                | 108               | 126               | 149               | 16%                   |

Source: INPUT







# Worldwide

## Information Services Program

COUNTRY PROFILE

LATIN AMERICA

## Venezuela

September 1996

### Economic Overview

Venezuela has come on hard times. Inflation continues at a high rate, unemployment is also high, and the hoped-for reforms of the federal government have been derailed by recent political restructuring that has resulted in a Venezuelan Congress controlled by the opposition—a poor formula for successful governmental reform.

In late 1995, the Venezuelan government began negotiations with the International Monetary Fund (IMF) to establish an economic program, including a \$3 billion loan to pay external debts. These negotiations have stalled due to the political changes and disagreements over necessary fiscal reforms—e.g., discontinuance of a gasoline subsidy that consumes 2% of GDP each year, removal of price controls, lifting exchange rate controls, and tax reform. The net result of these problems is that the Venezuelan economy remains very unstable, with the possibility of simultaneous economic and political unrest. As has been true for the last few decades, the majority of Venezuelan economic growth has occurred in the petroleum sector, which accounts for almost 25% of Venezuela's GDP.

GDP is expected to be a negative 0.5% in 1996, following a 2.2% growth in 1995 and a negative 3.3% in 1994. Inflation will run from 50% to 72% during the period 1995-1998, averaging about 60% through 2000. Unemployment, which was estimated at 11% in 1995, may, in reality, be closer to 15%, and is expected to increase by another 2% in 1996 due to a slowing economy. Labor unions are seeking pay hikes in the range of 150%, while the government has offered only a third of that. When wages increase, however, they will exert further upward pressures on inflation.

The Venezuelan economy and business environment is difficult to read. Rampant inflation, an uncertain political climate, a single-industry economy, unrealistic fixed exchange rates, and a variety of other factors all force Venezuelan businesses to adopt a "wait and see" attitude. Foreign investors and Venezuelan divisions of foreign companies are adopting a similar conservative approach to expanding activities in or entering the Venezuelan

market. This has generally contributed to the flattened or slightly negative economic posture. Not only are refiners and others in the petroleum business slowing down; manufacturers of consumer products are also feeling the effects of inflation and lowered consumer spending. In addition, many Venezuelan companies have been unable to find credit outside Venezuela, thus further limiting their growth.

Key Venezuelan economic indicators are summarized in Exhibit 1.

Exhibit 1

Key Economic Indicators—Venezuela

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 2.2%  |
| - 1996                     | -0.5% |
| Inflation Rate (1995-2000) | 56.6% |
| Unemployment Rate (1994)   | 9.0%  |
| Exchange Rate              | 466.5 |

Sources: GDP and Inflation Data, Bank of America, 1996  
Exchange Rates, Wall Street Journal, 7/96  
Unemployment Rates, CIA Factbook, 1995

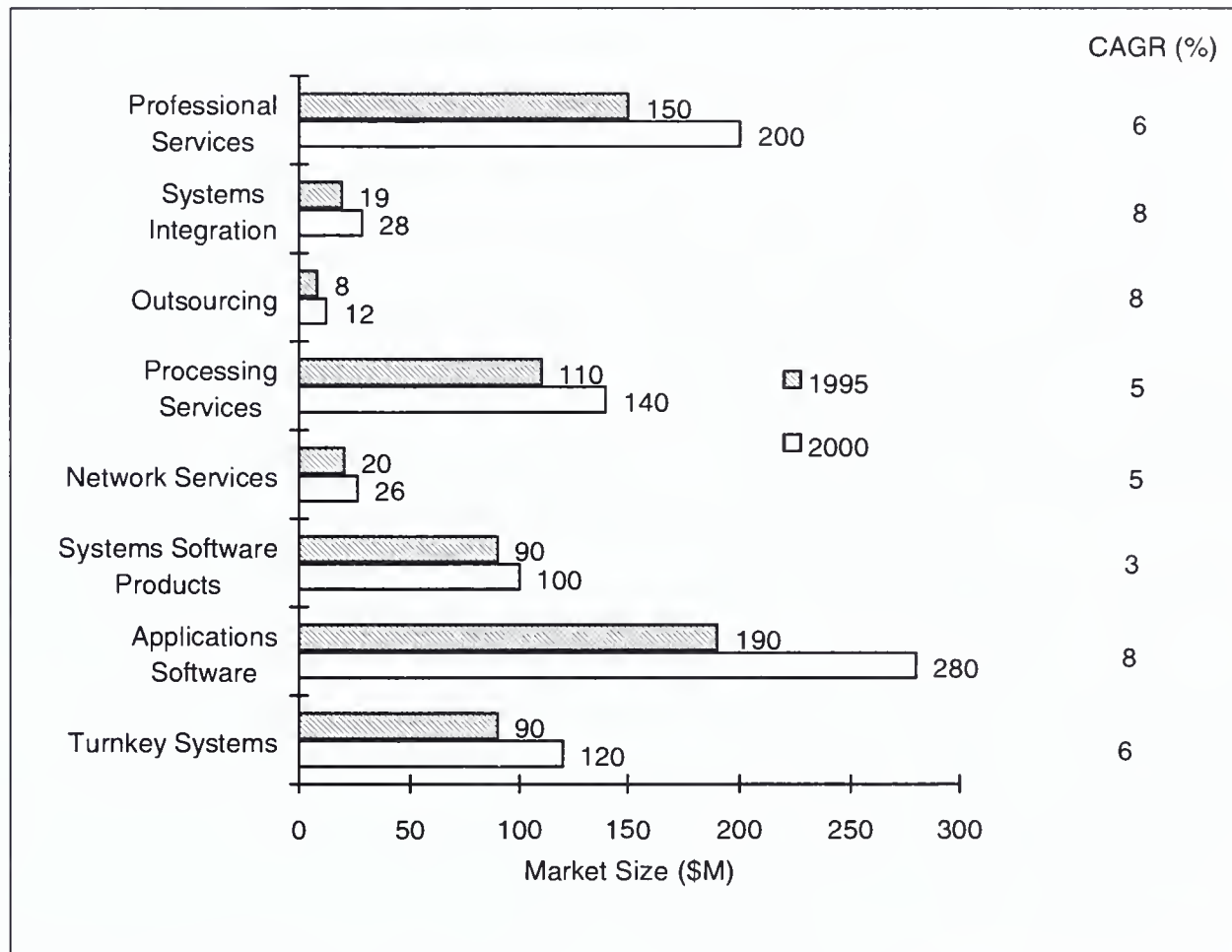
Information Services Market Forecast

Exhibit 2 summarizes INPUT’s market forecast for Venezuela for the eight information service categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

INPUT’s 1994-1999 information services market forecast for Venezuela showed a 17% growth from 1993-1994 and a 1994-1999 CAGR of 18%. These numbers have been dramatically reduced as the anticipated reforms that were expected to promote and insure economic stability have not taken place as planned. Unlike the other Latin nations tracked by INPUT (Argentina and Brazil), the Venezuelans have not yet successfully turned their economy around. Until they do, overall business growth and investment will be minimal, and typically made on a situational basis, as opposed to the normal, steady growth of an economy.

Exhibit 2

**Market Forecast by Product/Service Category  
Venezuela, 1995 - 2000**



Numbers are rounded.

Source: INPUT

INPUT estimates overall IT growth at 1% to 2%, and information services growth at a higher 7% to 8% rate. Information services in 1995 grew at a respectable 8% from 1994, and the CAGR through 2000 is 6%—dramatically reduced from the 18% anticipated in last year's report. The reduction reflects the new uncertainties (and fiscal conservatism) driven by continued political, economic, and fiscal concerns, and the inherent exposures of a single-industry economy. The fact that information services is growing at all is indicative of the cost-containment benefits of many of the product/service offerings.

The largest product/service markets are professional services and applications software. They will continue to grow at 6% and 8%, respectively, and underscore the dependence of this economy on expert IT consulting and software development, and the availability of outside software packages. Systems integration and outsourcing, both services starting from a relatively small base, will also grow at 8% over the forecast period, as the value and cost effectiveness of using outside suppliers to manage and install/enhance IT resources



continues to be recognized by businesses that must reduce expenses and contain costs. Processing services will see moderate, steady growth as this processing option—"pay-as-you-go"—appears more attractive in an uncertain economy. As stability returns to the Venezuelan economy—hopefully, later in the forecast period—the use of processing services will diminish in favor of outsourcing.

The Venezuelan telecommunications infrastructure, outside of proprietary oil company circuits, is relatively unsophisticated, and the use of network services—both on-line databases and VANs—is just beginning. It will be helped somewhat by the rapidly growing popularity of the Internet, but unlike Mexico (which has stated its intent to have a "world-class" telecommunications infrastructure by the year 2000) it is unlikely that there will be any strong movement toward developing the communications infrastructure until the economy stabilizes. Turnkey systems growth, outside the petroleum industry, will be negligible, and since the equipment element of such systems is generally a capital expenditure, growth of this market segment will be a conservative 3% over the next five years. Systems software growth is steady at 6% and will occur primarily for workstation/PC platform operating systems.

Although the information services market declined dramatically in 1995, the result of political and economic unrest, there are some encouraging signs. In response to fears of economic turmoil, "Venezuela Competitiva" and Fundacion Instituto de Ingeniera, non-profit civil and government organizations (respectively) were created to stimulate competition at both the private and the public levels. Targeted for aggressive promotion were information services—a positive step in the continued viability of this market.

*Venezuelan Market Observations* - Surprisingly, the government does not rank as one of the top information services consumers, yet the state-owned oil company, Petroleos de Venezuela, the main constituent in the petroleum industry, is the major local buyer. The financial sector, led by banks, is the second largest information services consumer. Following close behind are the public sector and the manufacturing industry. Research, business, and the private and public educational sectors have also demonstrated a steady demand for information services. Reasonable pricing, technical support and service, and quality will be the determining factors for purchases by both individual and corporate users. U.S. vendors have more than 200 Venezuelan dealers from which to choose, and though the reputation for U.S. products and services will keep their market share high, vendors should note the preference for Spanish-language software in order to maximize long-term market-share objectives.

*Venezuelan Market Issues* - In 1990, Venezuela restructured its tariff system and changed from a Brussels Tariff Nomenclature customs duty classification to a system fashioned after the Harmonized Tariff System. Presently, there is no tariff on manuals, but the tariff

on software stands at 15%, in addition to the 5% *ad-valorem* for hardware and software. Furthermore, to combat piracy, the Venezuelan Congress devoted a special section to software in its 1993 copyright law. In spite of this, the 1995 piracy rate was estimated at 71%. Fortunately, efforts by the Venezuelan Software Institute (INVESOFIT) and the Business Software Alliance (BSA) along with the expected lower prices resulting from increased sales, should produce a lower piracy rate for 1996.

*A Cautionary Note for Software Products Vendors* - The U.S. Department of Commerce International Trade Administration, in an April 30, 1996 announcement, designated Venezuela as one of the *Special 301 Watch List* countries. This indicated that intellectual property rights (IPRs) for items such as software are not accorded "adequate and effective protection." Although this designation is not the most serious for the violation of IPRs, it does indicate that there is a significant risk of illegal software copies being used in Venezuela. The U.S. and Venezuelan governments are negotiating a bilateral IPR agreement.

## Leading Software and Services Vendors

The following table (Exhibit 3) notes INPUT's estimate of Venezuela's leading software and services vendors. The company name, country of origin, and the products/services offered are also indicated. Although some revenue data is available, insufficient information for most companies makes estimates of market share unreliable. Accordingly, none are offered here. Data is based upon 1994 information.

Products developed in the U.S. account for more than 90% of the Venezuelan software market. Germany (a 5% share) and England (2%) also serve this market. Other countries—France, Canada, Chile, Argentina, Ecuador, and Colombia—have smaller market shares, primarily for vertical applications. Venezuelan developers have played a minor role in the information services market, but should not be overlooked. Of the locally produced software, 15% is exported to Mexico, Panama, and Costa Rica. MANAPRO, a native firm, tapped into the international Spanish-speaking market and gained \$5 million in exports. The technical labor force in Venezuela is highly skilled, but a significant number have been lured by other countries—many of which have the ability to offer higher salaries.

*On-Line Services* - On-line information services were introduced to Venezuela in 1995, with TRUENET and CompuServe the only two private firms offering Internet access. Though economic conditions have tempered the market's growth, rapid expansion is expected, even in the face of continued problems. For example, IBM created multimedia kiosks and installed them in major malls. Now Caracas consumers receive information

Exhibit 3

Leading Software and Services Vendors—Venezuela, 1994

| Company Name                        | Country of Origin | Products and Services offered                    |
|-------------------------------------|-------------------|--|
| IBM de Venezuela S.A.               | U.S.              | Software products                                |
| Digital Equipment de Venezuela      | U.S.              | Services, systems integration, software products |
| Oracle de Venezuela                 | U.S.              | Services, systems integration                    |
| MANAPRO C.A.                        | Venezuela         | Services, systems integration, software products |
| Corposistemas TEC, C.A.             | Venezuela         | Services, systems integration, software products |
| Grupo Ingedigit C.A.                | Venezuela         | Services, systems integration, software products |
| CYNUS, Integradores de Sistemas     | U.S.              | Services, systems integration, software products |
| Corporacion MS90 de Venezuela       | U.S.              | Software products                                |
| Beke Santos Software                | Venezuela         | Services, software products                      |
| INFORMIX Software de Venezuela S.A. | U.S.              | Software products                                |

Source: U.S. Department of Commerce

regarding utility company activities and can pay their bills electronically. Though it has not been a primary consumer in the past, the Venezuelan government recognizes the need for information technology to build a strong nation. As a result, in cooperation with the Interamerican Development Bank, CONICIT (the National Council for Scientific Research) is upgrading the government’s data transmission network.

IT Spending

Information technology has also felt the effects of economic and fiscal uncertainty, and IT budgets in Venezuela have been significantly restrained as a result of Venezuela’s economic woes. Many of the “wait and see” decisions that are being deferred until stability returns to the country are those related to information technology. The following table (Exhibit 4) offers INPUT’s estimate of 1995 IT spending in Venezuela. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or



systems integration contracts. These amounts are contained in their respective information services product/service categories, as noted in the following section, Forecast Database.

Exhibit 4

#### 1995 IT Spending—Venezuela

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 150                                 | 4                      |
| Internal Staff           | 1,150                               | 30                     |
| Equipment                | 940                                 | 25                     |
| Equipment Services       | 380                                 | 10                     |
| Facilities               | 490                                 | 13                     |
| Information Services     | 680                                 | 18                     |
| <b>Total IT Spending</b> | <b>3,790</b>                        | <b>100</b>             |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for Venezuela, for the period 1995-2000.



Exhibit 5

Information Services Market  
Venezuela, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| COUNTRY TOTAL              | 631        | 8%               | 680        | 705        | 739        | 789        | 851        | 917        | 6%             |
| Professional Services      | 139        | 9%               | 152        | 159        | 167        | 178        | 191        | 205        | 6%             |
| Systems Integration        | 17         | 12%              | 19         | 19         | 20         | 22         | 25         | 28         | 8%             |
| Outsourcing                | 7          | 14%              | 8          | 9          | 9          | 10         | 11         | 12         | 8%             |
| Processing Services        | 106        | 6%               | 112        | 114        | 118        | 125        | 134        | 144        | 5%             |
| Network Services           | 20         | 0%               | 20         | 21         | 22         | 24         | 25         | 26         | 5%             |
| Applications SW Products   | 174        | 9%               | 189        | 198        | 212        | 230        | 252        | 276        | 8%             |
| Systems SW Products        | 88         | 6%               | 93         | 96         | 100        | 106        | 115        | 124        | 6%             |
| Turnkey Systems            | 80         | 9%               | 87         | 89         | 91         | 94         | 98         | 102        | 3%             |

9/96 Revision: Corrects system software/turnkey system number reversal in earlier version.

Source: INPUT



# Worldwide

## Information Services Program

COUNTRY GROUPING

LATIN AMERICA

## Other Latin America

September 1996

### Geographic Area Definition

The “other” Latin American country grouping consists of the smaller Latin economies, including Panama, El Salvador, Guatemala, Honduras, Costa Rica, Uruguay, Paraguay, Peru, Bolivia, Colombia and Chile. Although each country has some information services activity, for most it is relatively minor, and only Chile can be considered a distinct market of some size and stability. For the purposes of this profile, where appropriate, specific references will be made to the Chilean economy or market, although in most cases the more global “other” Latin American viewpoint will apply.

### Economic Overview

As more and more Latin American countries develop (relatively) stable political environments, economic stability and attendant business and economic growth is becoming a reality. Economic common interest groups such as the Canadian-U.S.-Mexican North American Free Trade Agreement (NAFTA), the Southern Cone (Mercosur) Trading Community of Argentina, Brazil, Paraguay, and Uruguay, and The Andean Pact nations (Venezuela, Colombia, Ecuador, Peru, and Bolivia) are becoming major factors in Latin American economic activity. Chile, currently unaligned with any of the above groups, is being courted by Mercosur. The Free Trade Area of the Americas (FTAA), a sweeping economic plan for the Americas, is being studied by trade ministers from 34 Western Hemisphere countries in Cartagena, Colombia, with the hope of implementing a comprehensive program by 2005. Overall trade growth for the Latin American nations is estimated to have grown by 15% in 1995, with equivalent growth projected for the future.

Chile, a country with a stable economy whose primary products have been commodity exports, is now positioning itself as a capital exporter. The financial services are aimed primarily at investments in and support for neighboring economies and are supported by an ongoing pattern of prudent, conservative monetary and fiscal policies initiated by the

Chilean government. Chile anticipates a high (6.7%) growth in domestic product in 1996, down slightly from the impressive 8% growth posted in 1995. Business conditions in Chile will continue to produce strong profits, with larger corporations and financial services firms continuing their expansion into lucrative foreign markets. Similar business growth is expected for the balance of the Other Latin American nations, as the smaller nations benefit from the economic growth and stability being experienced in this region.

A table of consolidated GDP growth and inflation rates, unemployment figures, and exchange rates is not included in this country grouping profile, because consolidations of such figures for smaller economies tend to produce data of questionable statistical value. Data for Chile is included, however, as an example of the economic performance of the strongest (and largest) economy in this country grouping—a performance that should have a beneficial effect on other countries with which it has business relationships. The key economic indicators for Chile are noted in Exhibit 1.

Exhibit 1

1995 Key Economic Indicators—Chile

| Indicator                  | Value  |
|----------------------------|--------|
| GDP Growth Rate            |        |
| - 1995                     | 8.4%   |
| - 1996                     | 6.7%   |
| Inflation Rate (1995-2000) | 6.0%   |
| Unemployment Rate (1994)   | 6.0%   |
| Exchange Rate (per U.S.\$) | 410.15 |

Sources: GDP and Inflation - BofA World Information Services, 1996  
CIA World Factbook, 1995  
Exchange Rate: Wall Street Journal, 6/96

Information Services Market Forecast

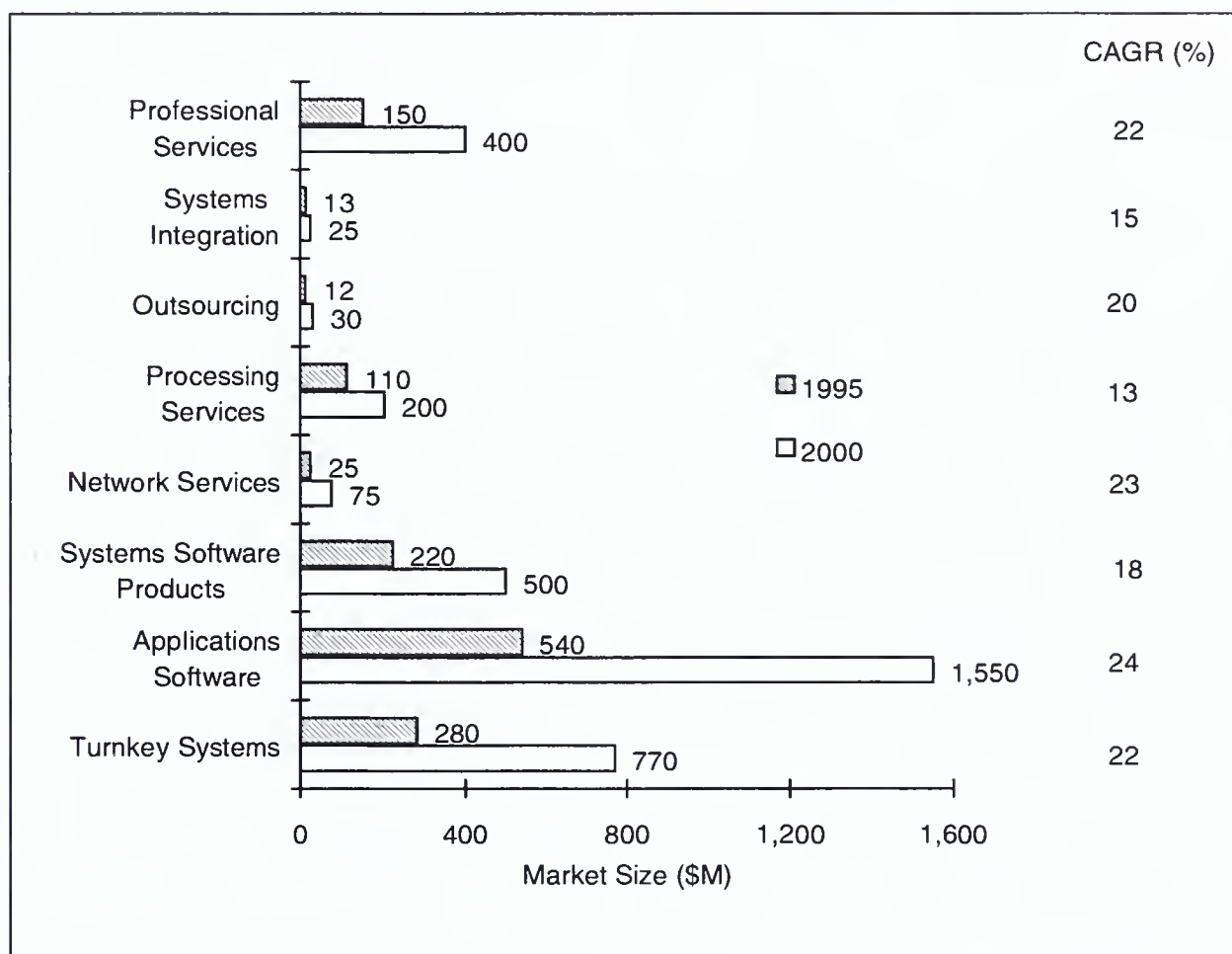
Exhibit 2 summarizes INPUT’s market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in billions of U.S.\$\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

INPUT forecasts that the Other Latin American market for information services will grow over the next five years at a rate of 21% per annum—from more than \$1.3 billion in 1995 to just over \$3.5 billion in 2000. This growth is being driven by increased usage in almost all information services areas, but is the result of the particularly strong 1995-2000 performance of professional services (a 22% compound annual growth rate—CAGR),

outsourcing (20% CAGR), network services (23%), applications software products (24%) and turnkey systems (22%).

Exhibit 2

**Market Forecast by Product/Service Category  
Other Latin America, 1995 - 2000**



Numbers are rounded.

Source: INPUT

Systems integration and outsourcing are relatively new markets starting from a small base. Both will experience a strong growth over the next five years—roughly doubling expenditures during that period—but will still remain relatively small markets. The strongest services growth, in absolute dollars, will be in professional services, where the broad range of support currently offered can be more easily related to the growing needs of the business community. Systems integration and outsourcing will become more important after the millennium, as business requirements necessitating a broader application of information technology resources to satisfy those requirements dictate the provision of more sophisticated solutions.

Network services growth is limited by the range and sophistication of currently installed telecommunications resources. As the communications infrastructure improves in the Other Latin American nations, there will be corresponding growth in the use of electronic information services (EIS) and the provision of network applications supporting network-



centric processing environments. Processing services will continue to be a cost-effective approach to satisfying common, ongoing applications needs on a transaction-based, pay-as-you-go basis, while the use of integrated turnkey systems to provide application support on smaller, more cost-effective workstation/PC platforms will continue to drive the growth of this information services product/service category. Minicomputer-based (e.g., AS/400) systems will also continue to be popular as the use of smaller, more powerful platforms obviates the need for larger mainframes in many application-specific areas.

Growth in the market for both systems and applications software products is being driven by the growing population of PCs. Chile alone is estimated to have more than 700,000 business and home computers, with 40% or more using Intel 486 or faster processors. In 1995, almost 120,000 PCs, mostly with multimedia capabilities, were imported by Chile and the Chilean market (and the broader Other Latin American market) for both hardware and software is dominated by U.S. suppliers. Although the major growth in software sales will be for workstation/PC-based products, minicomputers and mainframes will also continue to be viable software markets.

**Leading Software and Services Vendors**

The following table (Exhibit 3) notes a representative selection of major Other Latin American software and services vendors. The listing is representative, and not intended to identify all major vendors.

Sonda, Chile’s largest software firm, formed a joint venture in 1991 (known as DEAL, or Digital Equipment America Latina) with Digital to act as the U.S. manufacturer’s regional distributor. Sonda now has subsidiaries in almost every Latin American country.

Exhibit 4 identifies a number of software market opportunities in Other Latin American nations. The data was provided by the U.S. Department of Commerce, and offers an indication, by country, of the types of software each market will require over the next few years.

## Exhibit 3

**Selected Software and Services Vendors—Other Latin America, 1995**

| Company Name        | Provides |          |
|---------------------|----------|----------|
|                     | Services | Software |
| IBM                 | X        | X        |
| Digital             | X        | X        |
| Andersen Consulting | X        |          |
| Microsoft           |          | X        |
| Novell              |          | X        |
| Sonda (Chile)       |          | X        |

Source: INPUT

## Exhibit 4

**Selected Software Market Opportunities—Other Latin America**

| Country   | Software Opportunities   |
|-----------|--|
| Chile     | EDI, application, networking software for business/personal use  |
| Colombia  | “Windows” and networking software                                |
| Ecuador   | Software for all industrial and educational sectors              |
| Guatemala | Systems software, applications tools, and applications solutions |
| Honduras  | Software for government and large businesses                     |
| Peru      | Software for small to medium-sized companies                     |

Source: U.S. Department of Commerce

## IT Spending

The following table (Exhibit 5) offers INPUT's estimate of IT spending for the Other Latin American nations. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy costs), and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product or service.

Exhibit 5

1995 IT Spending—Other Latin America

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 280                              | 4                      |
| Internal Staff       | 2,050                            | 29                     |
| Equipment            | 1,800                            | 25                     |
| Equipment Services   | 710                              | 10                     |
| Facilities           | 920                              | 13                     |
| Information Services | 1,350                            | 19                     |
| Total IT Spending    | 7,110                            | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 6) for the Other Latin American nations, for the period 1995-2000.

Exhibit 6

Information Services Market  
Other Latin America, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| AREA TOTAL                 | 1,125      | 20%              | 1,349      | 1,632      | 1,968      | 2,395      | 2,915      | 3,553      | 21%            |
| Professional Services      | 122        | 20%              | 146        | 177        | 214        | 263        | 323        | 397        | 22%            |
| Systems Integration        | 12         | 8%               | 13         | 14         | 16         | 19         | 22         | 26         | 15%            |
| Outsourcing                | 10         | 20%              | 12         | 14         | 16         | 20         | 24         | 30         | 20%            |
| Processing Services        | 96         | 9%               | 105        | 116        | 130        | 149        | 171        | 196        | 13%            |
| Network Services           | 21         | 24%              | 26         | 32         | 39         | 48         | 59         | 73         | 23%            |
| Applications SW Products   | 440        | 23%              | 543        | 675        | 833        | 1,026      | 1,267      | 1,565      | 24%            |
| Systems SW Products        | 188        | 17%              | 220        | 260        | 305        | 360        | 424        | 500        | 18%            |
| Turnkey Systems            | 236        | 20%              | 284        | 344        | 415        | 510        | 625        | 766        | 22%            |

Source: INPUT









# Worldwide

## Information Services Program

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REGIONAL PROFILE

MIDDLE EAST/AFRICA

## Middle East/Africa

December 1996

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### Geographic Area Definition

The Middle East/African region consists of the many nations of the African continent, Israel, and the primarily Arabic nations of the Middle East. For the purpose of this profile, INPUT has defined this region to include Egypt, Israel, Saudi Arabia and South Africa—the nations that form the major economic base for the region.

### Economic Overview

Political, social and religious volatility continue to characterize the Middle East, although there has been some progress in all areas over the past few years. Israel is still an “island” in an Arabic “ocean,” but there are encouraging signs, such as the recent accord with the PLO. But much work remains before this area can concentrate on economic growth without the distractions of political or religious turmoil. For the foreseeable future, oil will form the foundation of the Middle East’s economy, and the majority of economic activity in both Egypt and Saudi Arabia will be strongly related to the extraction, refining and distribution of crude oil and petroleum products. Egypt also is a major producer of agricultural products. Israel is a significant technological center in the region and is now supplying products to new markets in Eastern Europe and the Asia/Pacific region. South Africa appears to have survived the demise of *apartheid* and is now aggressively positioning itself as the major economic force on the African continent. Rich in traditional natural resources, South Africa also has major gold and diamond deposits, which further strengthen the economy. The balance of Africa is so poor that IT costs and related telecommunications capability are simply not a major factor in current economic development. Of more pressing near-term concern are such issues as political stability, health conditions, poverty and/or continuing to build the economic infrastructure.

Key economic indicators for these four countries are noted in Exhibit 1.

Exhibit 1

1995 Key Economic Indicators—Middle East/Africa

| Country      | GDP Growth Rate |      | Inflation Rate | Unemployment Rate | Exchange Rate |
|--------------|-----------------|------|----------------|-------------------|---------------|
|              | 1995            | 1996 |                |                   |               |
| Egypt        | 4.6%            | 4.8% | 9.4%           | 10.0% (1995)      | 3.40          |
| Israel       | 7.1%            | 5.8% | 8.1%           | 6.6% (1993)       | 3.20          |
| Saudi Arabia | 1.0%            | 1.3% | 4.7%           | N/A               | 3.75          |
| South Africa | 3.3%            | 2.9% | 6.9%           | N/A               | 4.33          |

Sources: GDP, Inflation and Unemployment - BofA World Information Services, 1996  
CIA World Factbook, 1995  
Exchange Rate: Wall Street Journal, 6/96

The GDP growth assumptions in Exhibit 1 are for the years indicated, while the inflation rate assumptions are for 1995. Unemployment numbers are the latest available, for the year indicated, and do not take into account *underemployment*, a common condition in the Middle East/Africa region. Exchange rates are in units of local currency to purchase one U.S. dollar. Sources for this data are noted in the footnotes to the table.

The four nations present very stable growth rates, except for Israel, where fiscal controls and high interest rates will slow the economy by more than a full percentage point in 1996. GDP growth for Israel is expected to average 5% for the balance of this decade, however. Inflation rates are slightly higher than in other regions (except Latin America), but are not expected to have any significant negative affects on the region. Unemployment levels are hard to identify, but figures available from Egypt and Israel indicate that the labor force employment levels are at levels consistent with the rest of the world. However, these four nations have established economic infrastructures and the resources to train and otherwise provide the basic skills necessary to achieve government growth objectives.

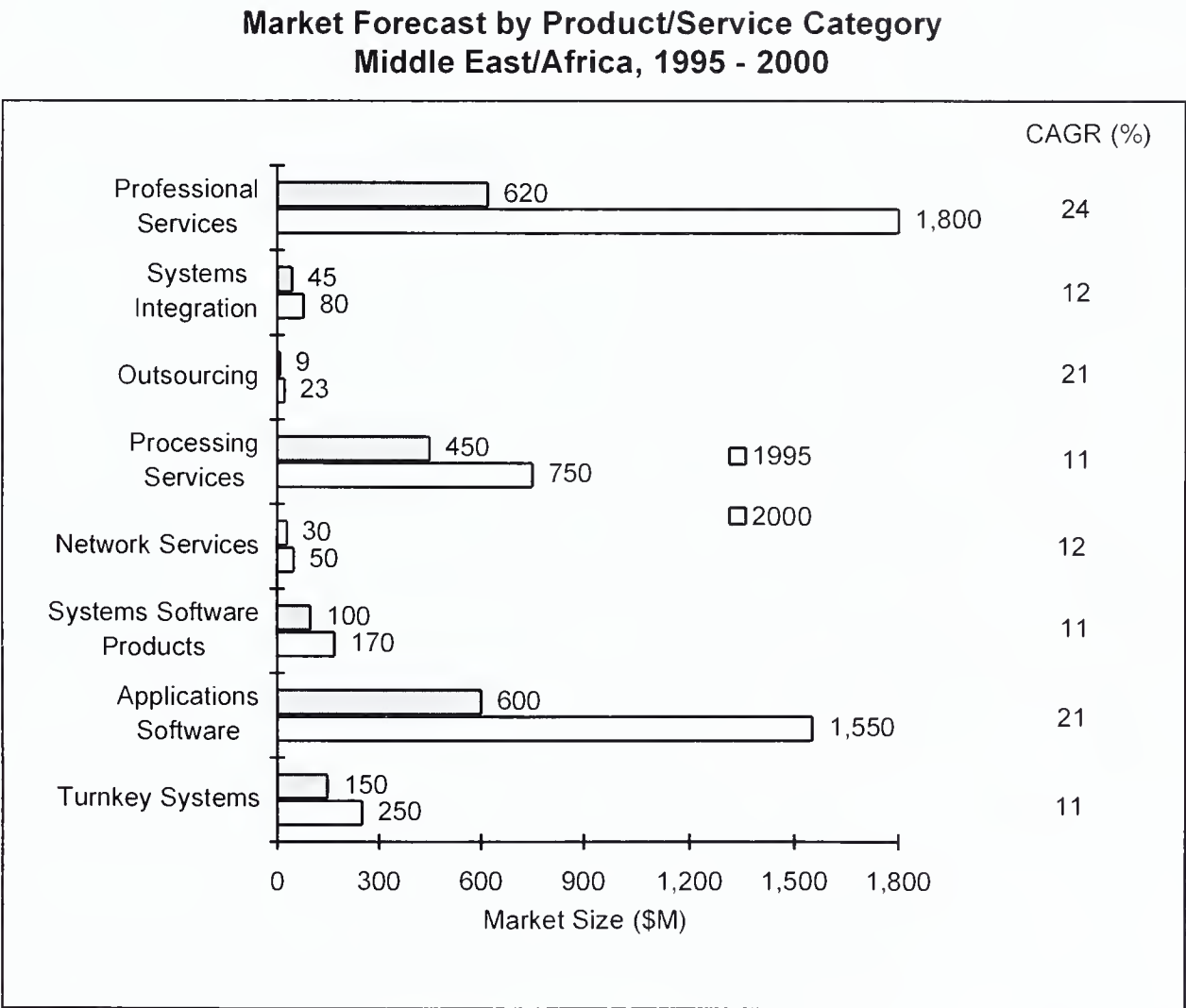
*Business Environment* - Egypt's movements toward privatization and its long-delayed structural reforms are bolstering business confidence. The same is true of Israel which is (apparently) successfully pursuing peace initiatives and enjoying improved business confidence as more focus is shifted from military activities to those of traditional business. Saudi Arabia is benefiting from the recent increase in oil prices and, like Egypt, the government is moving toward privatization—a strategy deemed necessary for future growth. The country must continue, however, to reduce its traditional dependence upon oil and its vulnerability to fluctuating oil prices. South Africa, one of the most technically sophisticated Middle East/African nations, is benefiting from its restored status as a viable economic entity and its recent successful political transformation. Social and economic imbalances are being addressed and conservative fiscal and economic policies should allow for sustained, steady growth. Unless another nation steps forward (and none is visible at this time), South Africa is, and will continue to be, the major economic force in Africa.

*Information Technology* - Major IT spending in the Middle East/African region is essentially limited to the four countries discussed in this profile. Although there continues to be strong movement toward the use of PCs in networked environments, such activities are necessarily limited to those countries with a reasonably capable telecommunications infrastructure.

Information Services Market Forecast

Exhibit 2 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$\$. A forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2



Numbers are rounded.

Source: INPUT

Overall, information services growth will be slightly below last year's five-year forecast—at 19% rather than 21%. The reduction reflects the overall stabilization of the region over the next five years and anticipates steady, rather than ballistic, growth. All four nations have



social and political issues that must be dealt with in addition to the information needs of business, but as their economies grow, information spending will follow—growing from almost \$2 billion in 1995 to over \$4.6 billion by 2000.

*Professional Services and Systems Integration* - Professional services will continue to grow, as its role as a major source of software development efforts and counseling regarding the application of information technology to business needs continues to expand. Moving from a small base, systems integration (SI) growth will be comparatively slow, limited somewhat by the existing established vendor relationships common to this region. However, as installed systems become more complex, acquisitions occur, or IT changes become necessary, the value of the dispassionate systems integrator will become more obvious, and SI contracts will become more common.

*Outsourcing and Processing Services* - Outsourcing will start to be a factor in this market as more companies seek to improve profits by fixing costs or concentrate internal resources on core business activities as opposed to IT-related functions. The majority of such contracts will be for platform and applications operations outsourcing, with some desktop services, business operations and applications, and network management contracts appearing toward the end of the decade. As more contract awards become visible—e.g., EDS's 1996 10-year contract with Automakers Ltd. of South Africa worth \$22.7 million—this market could well increase far beyond current projections. Processing services, a popular “pay-as-you-go” production environment that meets most current “outsourcing” business needs, will continue to grow at a moderate 11% rate. Many relationships will blur the distinction between outsourcing and processing services, as outside providers assume responsibility for portions of a business's production work.

*Applications and Systems Software Products* - Applications and systems software products markets will continue to grow at a combined rate of 20%, with the majority of the sales for workstation/PC products. As with most emerging or third-world nations, U.S. software products are preferred by Middle Eastern and African businesses for systems environments and application processing at all platform levels—mainframe, mini, and workstation/PC. Mainframe and mini software suites reflect the hardware manufacturer's offerings—a result of the relationships established during the sales, installation and maintenance activities. IBM, Unisys, Digital Equipment, and Hewlett-Packard are familiar names here, as in other emerging markets. Database vendors such as Oracle, and companies such as Microsoft and Novell are key providers of systems, network and applications software—especially for PCs. The software products market, largest of all Middle East/Africa information services markets, will grow from more than \$700 million in 1995, to in excess of \$1.7 billion by the millennium.

*Network Services* - Network services growth is steady at 12%, but, as with most Middle East/African nations, there are limited telecommunications facilities and growth in business usage will be metered by the overall growth of the telecommunications

infrastructure. The Internet is a powerful driving force, however, and the growing list of Internet access providers (IAPs) will also facilitate the use of electronic information services (EISs) for both business and government applications. Network applications, such as the value-added networks (VANs) in use in these countries to provide improved interactive business communications (example: Tradenet, an Egyptian VAN that provides access to a broad range of trade data), will continue to grow as these countries become more active in the global financial and trade markets.

*Turnkey Systems* - Turnkey systems will remain a moderate-sized, steady market, reflecting the slow pace of growth in the use of application-specific PC-based platforms for functions such as payroll, inventory, personnel management, and industrial design. The systems typically used in a heavy industrial environment are missing here, since none of the four nations covered in this profile have extensive discrete manufacturing infrastructures. Function-specific process manufacturing systems, such as those used in the petroleum industry, are used in both Egypt and Saudi Arabia. The market for turnkey systems in this region will grow from nearly \$150 million in 1995 to almost \$250 million in 2000, at a compound annual growth rate (CAGR) of 11%.

## Software and Services Vendors

The following table (Exhibit 3) provides a selection of major Middle East/African software and services vendors, by country. The listing is representative and is not intended to identify all major vendors. The exhibit indicates whether the primary information services offerings are software, services, or both.

As can be noted by entries in the column "Country of Origin," the majority of the information services vendors are U.S.-based firms, selling either through company offices, country subsidiaries, joint ventures, or agents in the countries indicated. Although U.S. and native companies are the majority of entries on the list, other countries, such as the United Kingdom and Germany, are also represented. The most common information services offerings from other foreign countries tend to be software products. For instance, although they are not identified as information services resources, Singapore, Taiwan and India, collectively, account for almost 30% of the applications software products sold in the Saudi Arabian market. Israel and the Philippines also provide extensive offshore programming capabilities for use in application development activities in this region.

## Exhibit 3

**Representative Software and Services Vendors—Middle East/Africa, 1995**

| Country and Company                 | Country of Origin | Offerings  |
|-------------------------------------|-------------------|--|
| <b><i>Egypt</i></b>                 |                   |  |
| Banyan                              | United States     | Software (LANs)                                  |
| Egyptnet                            | Egypt             | Services (VAN, network access)                   |
| Novell                              | United States     | Software (LANs)                                  |
| Oracle                              | United States     | Software   |
| Tradenet                            | Egypt             | Services (VAN, access to trade data)             |
| Unisys                              | United States     | Software and services                            |
| <b><i>Israel</i></b>                |                   |  |
| CompuServe                          | United States     | Services (Supplied via Kav Manhe)                |
| GoldNet                             | Israel            | Services (Subsid. of Israel's Nat'l Telecom Co.) |
| Microsoft                           | United States     | Software   |
| Oracle                              | United States     | Software   |
| Segev Computerized Info. Svcs. Ltd. | Israel            | Services (On-line databases)                     |
| Unisys                              | United States     | Software and services                            |
| <b><i>Saudi Arabia</i></b>          |                   |  |
| Andersen Consulting                 | United States     | Services   |
| AT&T (Saudi Arabia subsidiary)      | United States     | Services (Networks - TEP-6 project)              |
| Compuware                           | United States     | Software   |
| IBM                                 | United States     | Software and services                            |
| Oracle                              | United States     | Software   |
| Unisys                              | United States     | Software and services                            |
| <b><i>South Africa</i></b>          |                   |  |
| Andersen Consulting                 | United States     | Services   |
| Compustat                           | South Africa      | Software   |
| EDS                                 | United States     | Services   |
| EDS Africa                          | United States     | Services   |
| Hewlett-Packard                     | United States     | Software and services                            |
| IBM                                 | United States     | Software and services                            |
| ICL                                 | United Kingdom    | Software and services                            |
| Knowledge Systems International     | South Africa      | Software   |
| Lotus                               | United States     | Software   |
| Microsoft                           | United States     | Software   |
| Novell                              | United States     | Software   |
| Oracle                              | United States     | Software   |
| Q Data Consulting                   | South Africa      | Software   |
| Siemens Nixdorf Information Sys.    | Germany           | Services   |
| Unidata                             | South Africa      | Software   |
| Unisys                              | United States     | Software and services                            |

Source: INPUT  
and various media

Exhibit 4 notes representative internet access providers (IAPs) in this region.



## Exhibit 4

**Representative Middle East/Africa Internet Access Providers (IAPs)**

| <b>Country and Company</b>   |
|--|
| <b><i>Egypt</i></b>  |
| Connect Egypt<br>DATUM (IDS)<br>Egypt On-line<br>Egypt Web<br>Egyptian National STI Network<br>EUNET Egypt<br>IDSC/RITSEC<br>InTouch Communications Services, S.A.E.<br>MASH<br>SOFICOM<br>St@rNet Internet Services of Egypt  |
| <b><i>Israel</i></b>   |
| ACTCOM<br>DataServe Ltd.<br>elroNet<br>ILAN (Israeli Academic Network Information Center)<br>NetVision Ltd.<br>Shani   |
| <b><i>Saudi Arabia</i></b>   |
| <i>(No Major IAPs listed for this country, but the following two providers offer limited access or are evaluating service options)</i><br>Sahara Internet Service (Limited offering: e-mail and BBS)<br>SaudiNet (Pilot project of KACST)  |
| <b><i>South Africa</i></b>   |
| Aztec Information Management<br>Commercial Internet Services - Worldnet Africa<br>IBM Global Network<br>Interlink Internet Services<br>Internet Africa<br>Intertech Systems (Pty) Ltd.<br>Kingsley Technologies (Pty) Ltd.<br>PIPEX SA<br>PiX<br>SANGONet<br>SigNet Information Services<br>SmartNet South Africa<br>The Internet Solution |

Source: INPUT  
and various media

Although Saudi Arabia is an oil-rich nation with strong ties to the United States (dating to ARAMCO—Arabian American Oil Company—days), INPUT was unable to identify a full-



service IAP serving that country. The two listings are for limited or pilot project offerings. The King Abdulaziz City for Science and Technology (KACST) pilot project, however, has the backing of the government with the stated objectives of identifying Internet needs and establishing a local infrastructure capable of Internet linkage. With the exception of Saudi Arabia, the three other nations have ready access to the Internet and are developing telecommunications infrastructures that will ultimately allow increased access to that resource.

IT Spending

The following table (Exhibit 5) offers INPUT’s estimate of IT spending for Middle East/Africa. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product or service.

Exhibit 5

1995 IT Spending—Middle East/Africa

| Budget Category      | Estimated Spending (\$ Millions) | % of Total IT Spending |
|----------------------|----------------------------------|------------------------|
| Data Communications  | 400                              | 3                      |
| Internal Staff       | 3,600                            | 27                     |
| Equipment            | 4,000                            | 30                     |
| Equipment Services   | 1,600                            | 12                     |
| Facilities           | 1,750                            | 13                     |
| Information Services | 2,000                            | 15                     |
| Total IT Spending    | 13,350                           | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 6) for the Middle East/Africa, for the period 1995-2000.

## Exhibit 6

**Information Services Market  
Middle East/Africa, 1995-2000**

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| REGIONAL TOTAL             | 1,715      | 16%              | 1,991      | 2,339      | 2,764      | 3,293      | 3,928      | 4,666      | 19%            |
| Professional Services      | 505        | 22%              | 615        | 765        | 945        | 1,170      | 1,450      | 1,800      | 24%            |
| Systems Integration        | 40         | 10%              | 44         | 50         | 55         | 62         | 69         | 78         | 12%            |
| Outsourcing                | 8          | 13%              | 9          | 11         | 14         | 17         | 20         | 23         | 21%            |
| Processing Services        | 400        | 11%              | 445        | 490        | 545        | 600        | 675        | 750        | 11%            |
| Network Services           | 25         | 12%              | 28         | 31         | 35         | 39         | 44         | 50         | 12%            |
| Applications SW Products   | 510        | 18%              | 600        | 715        | 860        | 1,060      | 1,290      | 1,550      | 21%            |
| Systems SW Products        | 92         | 11%              | 102        | 114        | 125        | 140        | 155        | 170        | 11%            |
| Turnkey Systems            | 135        | 10%              | 148        | 163        | 185        | 205        | 225        | 245        | 11%            |

Source: INPUT











## North America

September 1996

### Geographic Area Definition

The North American region consists of Canada, Mexico and the United States. Because Canada and Mexico share United States' boundaries (northern and southern) and, as a result of the North American Free Trade Agreement (NAFTA), the three countries now also share many common economic and trade interests. Before NAFTA, INPUT included Mexico in the Latin American region.

### Economic Overview

North America's economic environment, in terms of absolute dollars, is dictated by the American economy. Exhibit 1 notes the relative performance of the three economies—Canada, Mexico and the United States—as determined by 1995 GDP.

#### Exhibit 1

#### 1995 Gross Domestic Product (GDP)—North American Countries

| Country             | 1995 GDP U.S.\$ (Trillions) | Percentage of North America |
|---------------------|-----------------------------|-----------------------------|
| Canada              | 0.60                        | 8                           |
| Mexico              | 0.25                        | 3                           |
| United States       | 7.00                        | 89                          |
| Total North America | 7.80                        | 100                         |

Note: GDP values are rounded

Source: U.S. Department of Commerce, 1996  
BofA World Information Services, 1996

Rebounding from a weak 1994, the U.S. economy showed strong growth in 1995 in almost all areas. Real GDP is expected to continue to grow at a steady 2% in 1996, improving to 2.2% for the balance of the decade. Although their real GDP performance in 1995 varied

from U.S. figures, 1996 will see GDP growth similar to that of the U.S. for both Mexico (2.0%) and Canada (1.8%). Mexico’s performance is especially impressive, as it follows the 1994 devaluation of the peso and a negative 7.0% growth rate in 1995. The fact that Canada and Mexico are two of the top three importers of U.S. goods worldwide (Japan is the third) is a further indicator of the U.S.’ dependence on the economic well-being of its northern and southern neighbors.

Key economic indicators for the North American nations are summarized in Exhibit 2.

Exhibit 2

1995 Key Economic Indicators—North America

| Country       | Real GDP Growth Rate |      | Inflation Rate | Unemploy-ment Rate | Exchange Rate |
|---------------|----------------------|------|----------------|--------------------|---------------|
|               | 1995                 | 1996 |                |                    |               |
| Canada        | 2.2%                 | 1.8% | 1.9%           | 9.6% (1994)        | 1.36          |
| Mexico        | -7.0%                | 2.0% | 26.0%          | 9.8% (1994)        | 7.58          |
| United States | 3.2%                 | 2.0% | 2.6%           | 5.5% (1995)        | N/A           |

Sources: GDP and Inflation - BofA World Information Services, 1996  
CIA World Factbook, 1995  
Exchange Rate: Wall Street Journal, 6/96

The GDP growth assumptions in Exhibit 2 are for the years indicated, while the inflation rate assumptions are averages for the period 1995-2000. Unemployment numbers are the latest available, for the year indicated, and do not take into account *underemployment*, a common condition in Latin American countries and in Mexico. Exchange rates are in units of local currency to purchase one U.S. dollar. Sources for this data are noted in the footnotes to the table.

Although Mexico’s inflation rate remains relatively high, it is declining steadily and is expected to be in the 12% to 14% range in 2000. Although the unemployment rates are high compared to the U.S., viewed from a global perspective they are moderate and are lower than eight of the sixteen European nations considered by the Worldwide Program in its country analyses. The Mexican figure, however, does not include “underemployment” (working less than 35 hours per week), a condition affecting nearly 20% of Mexico’s labor force.

The U.S. economy appears to be on a fairly stable path for the balance of this decade. Canada and Mexico are both addressing their key economic and political issues with effective programs and should continue their current positive growth patterns. As a result, the North American region will see steady positive economic growth, continuing improvement in business conditions and, therefore, business spending for information technology.

**NAICS** - NAFTA is generally regarded as a success, and though there have been some implementation problems, the huge exodus of U.S. jobs to NAFTA partners feared by some groups has not occurred—in fact, U.S. unemployment levels have been slowly decreasing as a growing economy creates more jobs. One measure of NAFTA's success has been a recent recognition by the U.S. Office of Management and Budget (OMB) that there need to be changes to the 50-year-old Standard Industry Classification (SIC) codes. Under the provisions of NAFTA, the SIC system, which divides business enterprises into ten broad industry-specific categories, will be replaced by the North American Industry Classification System (NAICS), tentatively scheduled for introduction in 1997.

The new NAICS structure, outlined in a series of *Federal Register* notices, is designed to improve uniformity and comparability of the statistical classification standards underlying all establishment-based federal economic analysis. The restatement of common industry definitions, proposed by the governments of the United States, Canada, and Mexico, will reflect the global movement toward a services-based economy. The three key concepts of the new NAICS are:

- *International Comparability* - The current SIC system was not designed to be compatible with systems of other countries, and users have stressed the importance of international comparability to conduct reliable statistical analysis across borders and across industries.
- *Product-Oriented Concept* - Uses of industry statistics often require that data on inputs and outputs be used together. The NAICS classifications will be based on a production-oriented or supply-based conceptual framework.
- *Emphasis on New Industries* - Existing SIC classifications are weakest for emerging industries, services, and providers of advanced technologies. The NAICS will develop improved classifications for these industries by using the production-oriented concept.

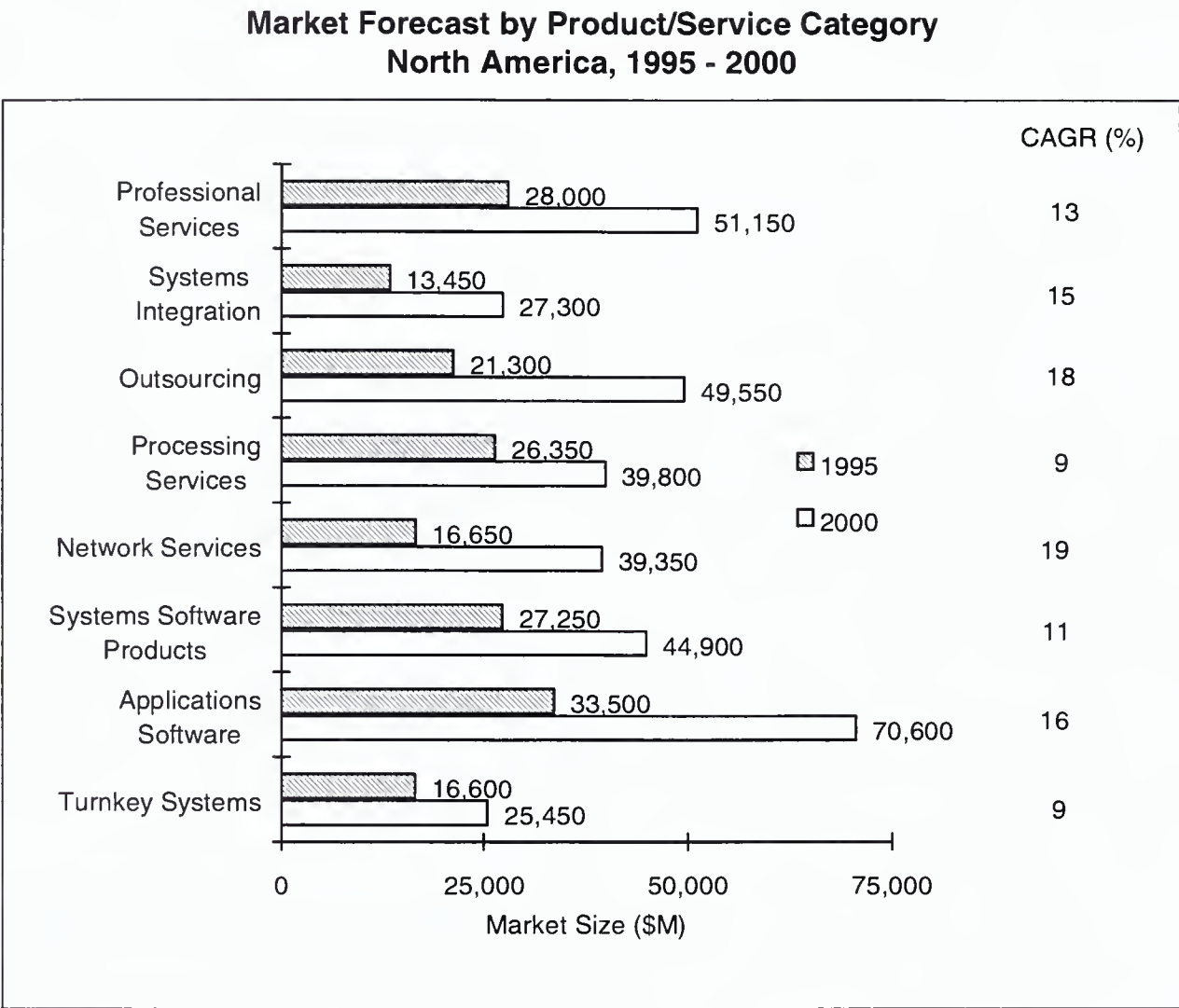
The new NAICS system is further proof of not only the viability of NAFTA (the members *can* actually cooperate), but also the expected longevity of this regional economic concept that has been anticipated by its creators.

## Information Services Market Forecast

Exhibit 3 summarizes INPUT's market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in millions of U.S.\$ . A detailed forecast of the components of each product/service category is provided in the Forecast Database section.



Exhibit 3



Numbers are rounded.

Source: INPUT

INPUT forecasts that the North American regional market for information services will grow over the next five years at a rate of 14% per annum—from more than \$183 billion in 1995 to just over \$348 billion in 2000. This growth is being driven by the strong U.S. information services market and increased usage in almost all information services areas. Double-digit growth will be seen in all product/service categories except processing services and turnkey systems, and these two markets are each growing at 9%.

Comparative country shares of the 1995 and 2000 information services markets are noted in Exhibit 4. Because of the size and strength of the United States market, there will essentially be no changes in market share during the forecast period. This does not, however, imply any weakness in either the Canadian or Mexican information services markets, but rather indicates their ability to maintain pace with the largest, strongest information services market in the world—the United States.

## Exhibit 4

**Country Percentages of Total North American  
Information Services Market, 1995 and 2000**

| Country       | Market Share - 1995 | Market Share - 2000 |
|---------------|---------------------|---------------------|
| Canada        | 4.7%                | 4.9%                |
| Mexico        | 0.6%                | 0.7%                |
| United States | 94.7%               | 94.4%               |

Source: INPUT

Exhibit 5 notes the 1994-1995 growth rates for total information services spending for the countries indicated, followed by the five-year CAGRs for the period 1995-2000. The 1% decrease in forecast growth for the 1995-2000 period for Canada is minor, and reflects some lingering concerns regarding Quebec's independence (should it occur) and the overall effect that would have on the Canadian economy. Mexico's 50% increase in its growth rate is consistent with economic, business, and technology spending estimates, and reflects the anticipated benefits that NAFTA will accord the Mexican economy—the one for which NAFTA offers the most long-term opportunity and potential.

## Exhibit 5

**Country Growth Percentages, North American  
Information Services Market, 1995 and 2000**

| Country                      | 1994-1995 Growth | 1995-2000 Growth |
|------------------------------|------------------|------------------|
| Canada                       | 16%              | 15%              |
| Mexico                       | 12%              | 18%              |
| United States                | 13%              | 14%              |
| <b>North American Region</b> | 13%              | 14%              |

Source: INPUT

Due to the U.S.'s influence, regional examination of product/service opportunities will essentially be identical to the analysis performed for the U.S. market (see the *United States* country profile). In fact, all North American region five-year growth percentages are identical to U.S. percentages for the same period, except for systems integration, which is depressed very slightly by the slow movement of Canadian businesses to this service alternative.

Exhibit 6 notes the three largest information services markets in each country in the year 2000, and the three fastest growing markets for the forecast period, 1995-2000.

Exhibit 6

**Largest and Fastest Growing Information Services Markets, by Country  
North America, 1995-2000**

| Country       | Largest Markets, 2000  | Fastest Growing Markets (95-00)   |
|---------------|--|---|
| Canada        | <ul style="list-style-type: none"><li>• Outsourcing</li><li>• Professional Services</li><li>• Applications Software Products</li></ul>               | <ul style="list-style-type: none"><li>• Outsourcing</li><li>• Network Services</li><li>• Applications Software Products</li></ul>         |
| Mexico        | <ul style="list-style-type: none"><li>• Applications Software Products</li><li>• Professional Services</li><li>• Systems Software Products</li></ul> | <ul style="list-style-type: none"><li>• Applications Software Products</li><li>• Network Services</li><li>• Systems Integration</li></ul> |
| United States | <ul style="list-style-type: none"><li>• Applications Software Products</li><li>• Professional Services</li><li>• Systems Software Products</li></ul> | <ul style="list-style-type: none"><li>• Network Services</li><li>• Outsourcing</li><li>• Applications Software Products</li></ul>         |

Source: INPUT

Applications software products is one of the largest product/service markets in each North American country, as is professional services. Applications software is also one of the fastest growing markets in all three countries. The combined attributes of fast growing and large identify applications software products as a major area of opportunity in North America.

**Leading Software and Services Vendors**

The following table (Exhibit 7) notes a representative selection of major North American software and services vendors. The listing is representative and is not intended to identify all major vendors or all their areas of activity. The exhibit indicates the company, country of origin, and North American countries in which the company does business. Also noted is whether the vendor’s primary information services offerings are software products (SW) or information services (Svcs). Software products does not include client-specific software development activities such as those performed by professional services companies, but is limited to “packaged” software that is generally ready for immediate use by the purchaser. Note that the Mexican firm, Central del Software, is a distributor (primarily of U.S. software), not a developer of software products.

The two Mexican firms, from a size standpoint, are significantly smaller than the other firms noted, but are important vendors in their own country. Other major North American vendors would include CSC, Unisys, Oracle and Hewlett-Packard, from the United States—top-ten vendors based upon U.S. information services market share.

## Exhibit 7

## Representative Major Software and Services Vendors—North America, 1995

| Company Name          | Country of Origin | Offers SW   Svcs | Serves Canada | Serves Mexico | Serves the U.S. |
|-----------------------|-------------------|------------------|---------------|---------------|-----------------|
| IBM                   | U.S.              | X X              | X             | X             | X               |
| EDS                   | U.S.              | X                | X             | X             | X               |
| Microsoft             | U.S.              | X                | X             | X             | X               |
| Andersen Consulting   | U.S.              | X                | X             | X             | X               |
| DMR                   | Canada            | X                | X             |               |                 |
| Computer Associates   | U.S.              | X                | X             | X             | X               |
| Digital               | U.S.              | X X              | X             | X             | X               |
| SHL Systemhouse       | Canada            | X                | X             | X             | X               |
| Infogama              | Mexico            | X                |               | X             |                 |
| Central del Software* | Mexico            | X                |               | X             |                 |

\* Software products distributor

Source: INPUT

## IT Spending

The following table (Exhibit 8) offers INPUT's estimate of IT spending for North America. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product or service.

## Exhibit 8

## 1995 IT Spending—North America

| Budget Category          | Estimated Spending (\$ Millions) | % of Total IT Spending |
|--------------------------|----------------------------------|------------------------|
| Data Communications      | 60,150                           | 9                      |
| Internal Staff           | 223,600                          | 33                     |
| Equipment                | 130,500                          | 19                     |
| Equipment Services       | 34,950                           | 5                      |
| Facilities               | 48,650                           | 7                      |
| Information Services     | 183,100                          | 27                     |
| <b>Total IT Spending</b> | <b>680,950</b>                   | <b>100</b>             |

Numbers are rounded.

Source: INPUT



Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 9) for North America, for the period 1995-2000.

Exhibit 9

Information Services Market  
North America, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| REGIONAL TOTAL             | 162,439    | 13%              | 183,090    | 207,031    | 234,751    | 266,408    | 303,907    | 348,061    | 14%            |
| Professional Services      | 24,739     | 13%              | 28,010     | 31,470     | 35,623     | 40,178     | 45,356     | 51,126     | 13%            |
| Systems Integration        | 12,166     | 10%              | 13,440     | 15,765     | 18,091     | 20,741     | 23,804     | 27,288     | 15%            |
| Outsourcing                | 17,748     | 20%              | 21,311     | 25,024     | 29,600     | 35,019     | 41,578     | 49,526     | 18%            |
| Processing Services        | 24,268     | 9%               | 26,337     | 28,517     | 30,975     | 33,580     | 36,547     | 39,818     | 9%             |
| Network Services           | 14,255     | 17%              | 16,646     | 19,618     | 23,294     | 27,623     | 32,938     | 39,355     | 19%            |
| Applications SW Products   | 29,207     | 15%              | 33,485     | 38,576     | 44,550     | 51,582     | 60,145     | 70,611     | 16%            |
| Systems SW Products        | 24,779     | 10%              | 27,241     | 29,875     | 32,846     | 36,218     | 40,205     | 44,900     | 11%            |
| Turnkey Systems            | 15,277     | 9%               | 16,620     | 18,186     | 19,772     | 21,467     | 23,334     | 25,437     | 9%             |

Source: INPUT



# Worldwide

## Information Services Program

COUNTRY PROFILE

NORTH AMERICA

## Canada

September 1996

### Economic Overview

Canada's economy, in response to ongoing uncertainties over the status of the French-speaking province of Quebec and ongoing monetary tightening, will continue to experience slow growth over the forecast period, 1995-2000. The narrow defeat of the Quebec independence initiative surprised many Canadians, and many individuals and businesses now recognize that there is a strong possibility that Quebec will eventually separate from the rest of Canada. Lucien Bouchard, Quebec's newly elected premier, has indicated that he will hold another referendum before the millennium, thus fueling ongoing uncertainty regarding Canada's economic future. One of the by-products of this uncertainty is an expected exodus of both businesses and families from the province, as they both seek the greater (anticipated) stability of the English-speaking communities. Questions regarding the future of Canada are also causing investor uncertainties and contribute to the anticipated low GDP growth rates noted in Exhibit 1.

On the positive side, Canada's easing of 1995's tightened monetary policies should lessen any fears of a recession, inflation is expected to remain below 2%, and exports should increase as the result of steadily improving productivity and limited wage increases. These conditions, coupled with the industry restructurings tied to both NAFTA and the U.S./Canadian Free Trade Agreement, are leading to improved profits for Canadian businesses.

Efforts continue to reduce Canadian government budget deficits by reducing payments for various services to provincial governments—steps similar to those taken by the U.S. government to reduce federal deficits by shifting many costs to the states. Canada's near-term goals are to reduce the deficit to 4.2% in fiscal year 1995-1996, and to as low as 2% by 1997-1998.

Key Canadian economic indicators are summarized in Exhibit 1.

Exhibit 1

1995 Key Economic Indicators—Canada

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | 2.2%  |
| - 1996                     | 1.8%  |
| Inflation Rate (1995-2000) | 1.9%  |
| Unemployment Rate          | 9.6%  |
| Exchange Rate (per U.S.\$) | 1.36  |

Sources: GDP and Inflation - BofA World Information Services, 1996  
CIA World Factbook, 1995  
Exchange Rate: Wall Street Journal, 6/96

Information Services Market Forecast

Exhibit 2 summarizes INPUT’s market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in billions of U.S.\$ . A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

INPUT forecasts that the Canadian market for information services will grow over the next five years at a rate of 15% per annum— from more than \$8.6 billion in 1995 to just over \$17 billion in 2000. This strong growth is being driven by increasing use of network services (16% CAGR for the period 1995-2000) and outsourcing (23% CAGR).

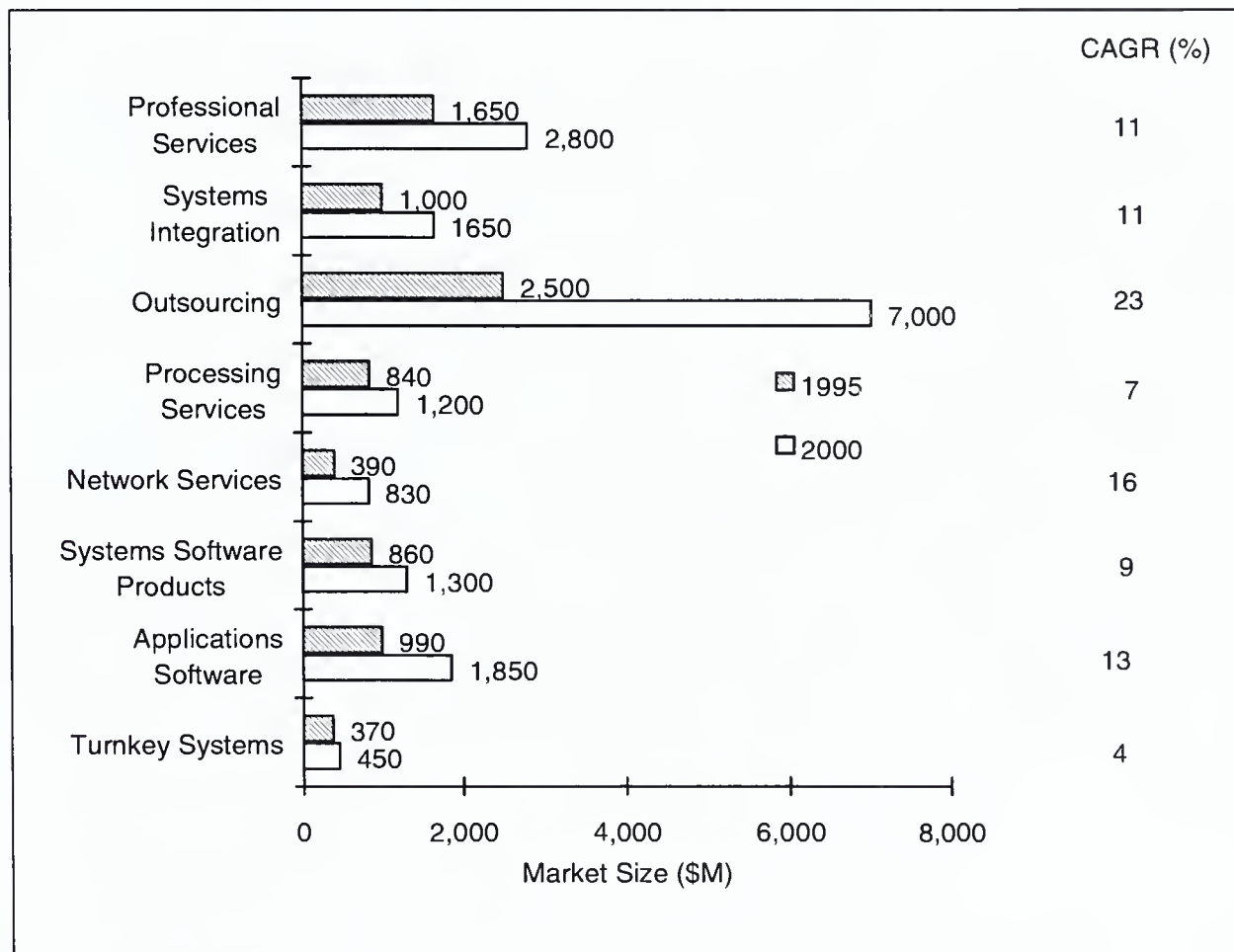
Professional services growth is being driven by steady use of both IS consulting and software development services, both used by many clients who are either downsizing or installing client/server systems to obtain better cost efficiencies. Driving the use of professional services are ongoing needs for technical expertise that is in limited supply, and prudent business practices that, in periods of economic uncertainty, dictate the use of outside resources in order to keep burdened permanent staff costs at a minimum.

Systems integration (SI) spending will remain at about the same levels as forecast for the 1994-1999 period. The largest market and highest growth rate will be for SI-related professional services—an area of increasing activity as more businesses seek faster implementation of complex systems in order to achieve a competitive advantage.

Canadian outsourcing activities—taking a page from the U.S. marketplace—are on the rise. Business operations, a newly defined outsourcing category, has been added to the outsourcing grouping. This market, totaling almost \$1.4 billion in 2000, is defined as a relationship in which one vendor is responsible for performing an entire business or operations function, including the information systems outsourcing that supports it. Examples include employee benefits processing, and telephone company billing. A review of Canadian outsourcing contracts has resulted in a significant increase in the current spending for such services, and based upon contract projections, the growth rate has been increased from 18% for the period 1994-1999 to 23% for 1995-2000. Canadian businesses, as are those in most other countries, are finding that there are significant long-term benefits of using internal assets to concentrate core competencies and fixing IT costs and performance at desired levels through contractual relationships with outside, specialized vendors.

Exhibit 2

**Market Forecast by Product/Service Category  
Canada, 1995 - 2000**



Numbers are rounded.

Source: INPUT



Processing services growth is steady at 7%, with the major base in pay-as-you-go transaction processing (e.g., payroll services), but the most opportunity (e.g., highest growth rate) is occurring with “other processing,” which includes disaster recovery or contingency processing services and electronic off-site data storage capabilities. Eyeing the series of highly publicized natural disasters and man-made cataclysms, Canadian businesses are increasingly protecting assets and production resources by using outside, secure resources.

Network services usage, driven by the rapidly expanding awareness of the Internet and its capabilities, continues to grow at a steady five-year rate of 16%. The trend toward network-centric computing and client/server systems is expanding the role of enterprise networks—a factor reflected in the continued vigorous growth of network applications. Electronic commerce use, for instance, is growing in such industry areas as banking/finance, wholesale and retail trade, manufacturing, and business services. Electronic information systems (EIS) usage, driven by the Internet-related concept that almost anything you want to know is available somewhere on-line, is also maintaining steady growth. INPUT expects that the 15% growth projected for this market area may be conservative, and as more “hidden” usage patterns are identified and more popular services become fee-based (rather than free, as in the past), network services usage will increase.

Systems and applications software product use will continue at a steady level, with more than half the 2000 spending being for workstation/PC-based platforms, up from 39% in 1995. Turnkey systems will grow at a modest 4% during the forecast period, with growth occurring only in spending for turnkey-related professional services.

Leading Software and Services Vendors

The following table (Exhibit 3) notes a representative selection of major Canadian software and services vendors and identifies the significant industry sectors in which they offer products and/or services. The listing is representative, and is not intended to identify all major vendors or all markets in which they participate.

Column abbreviations are: Mfg for manufacturing; B/F for Banking and Finance; Ins for Insurance; Whl for Wholesale Trade; Ret for Retail Trade; Utl for Utilities, Tel for Telecommunications; and BSv for Business Services.

## Exhibit 3

**Selected Canadian Software and Services Vendors—by Industry**

| Vendor Name         | Mfg | B/F | Ins | Whl | Ret | Utl | Tel | BSv |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Andersen Consulting | X   |     | X   |     | X   | X   | X   | X   |
| CGI                 |     |     |     |     | X   |     |     |     |
| C & L               |     |     | X   |     | X   |     |     |     |
| Digital             | X   | X   | X   | X   | X   | X   | X   | X   |
| DMR                 | X   | X   | X   | X   |     |     |     | X   |
| EDS                 |     |     | X   |     |     |     |     |     |
| Ernst & Young       | X   | X   | X   | X   |     | X   | X   |     |
| IBM                 | X   | X   | X   | X   | X   | X   | X   | X   |
| LGS                 | X   |     | X   |     |     | X   | X   |     |
| Price Waterhouse    |     |     |     |     |     | X   | X   |     |
| SHL Systemhouse     | X   | X   | X   | X   |     | X   | X   | X   |

Source: INPUT

## IT Spending

The following table (Exhibit 4) offers INPUT's estimate of IT spending in the Canada. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

IT-related trends that are affecting Canadian IT expenditure patterns include:

- Growing use of network-based applications, including use of the Internet
- Implementation of client/server technology
- Business process reengineering activities
- Growing importance of electronic commerce
- Downsizing
- Increased use of imaging

Exhibit 4

1995 IT Spending—Canada

| Budget Category      | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|----------------------|-------------------------------------|------------------------|
| Data Communications  | 2,000                               | 6                      |
| Internal Staff       | 10,300                              | 31                     |
| Equipment            | 6,950                               | 21                     |
| Equipment Services   | 2,300                               | 7                      |
| Facilities           | 3,000                               | 9                      |
| Information Services | 8,650                               | 26                     |
| Total IT Spending    | 33,200                              | 100                    |

Numbers are rounded.

Source: INPUT

Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for Canada, for the period 1995-2000.

## Exhibit 5

### Information Services Market Canada, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 7,424      | 16%              | 8,631      | 9,843      | 11,278     | 12,889     | 14,842     | 17,090     | 15%            |
| <b>Professional Services</b>    | 1,473      | 12%              | 1,646      | 1,837      | 2,053      | 2,280      | 2,540      | 2,820      | 11%            |
| - IS Consulting                 | 541        | 13%              | 611        | 690        | 780        | 870        | 975        | 1,085      | 12%            |
| - Education & Training          | 266        | 12%              | 298        | 333        | 373        | 415        | 465        | 520        | 12%            |
| - Software Development          | 666        | 11%              | 737        | 814        | 900        | 995        | 1,100      | 1,215      | 11%            |
| <b>Systems Integration</b>      | 914        | 10%              | 1,005      | 1,104      | 1,215      | 1,341      | 1,510      | 1,660      | 11%            |
| - Equipment                     | 358        | 8%               | 387        | 419        | 454        | 493        | 532        | 570        | 8%             |
| - Software Products             | 172        | 9%               | 187        | 203        | 222        | 244        | 272        | 302        | 10%            |
| - Professional Services         | 342        | 13%              | 387        | 435        | 490        | 552        | 651        | 731        | 14%            |
| - Other                         | 42         | 5%               | 44         | 47         | 49         | 52         | 55         | 57         | 5%             |
| <b>Outsourcing</b>              | 1,895      | 33%              | 2,526      | 3,107      | 3,834      | 4,684      | 5,739      | 7,011      | 23%            |
| - Platform Operations           | 900        | 39%              | 1,250      | 1,550      | 1,950      | 2,420      | 3,010      | 3,760      | 25%            |
| - Applications Operations       | 230        | 16%              | 267        | 311        | 362        | 420        | 489        | 560        | 16%            |
| - Desktop Services              | 210        | 22%              | 256        | 312        | 380        | 463        | 562        | 685        | 22%            |
| - Network Management            | 190        | 23%              | 233        | 289        | 352        | 431        | 528        | 646        | 23%            |
| - Business Operations           | 365        | 42%              | 520        | 645        | 790        | 950        | 1,150      | 1,360      | 21%            |
| <b>Processing Services</b>      | 783        | 7%               | 839        | 900        | 966        | 1,028      | 1,102      | 1,179      | 7%             |
| - Transaction Processing        | 483        | 8%               | 522        | 564        | 609        | 650        | 700        | 750        | 8%             |
| - Utility Processing            | 247        | 3%               | 255        | 264        | 272        | 280        | 287        | 294        | 3%             |
| - Other Processing              | 53         | 17%              | 62         | 72         | 85         | 98         | 115        | 135        | 17%            |
| <b>Network Services</b>         | 334        | 18%              | 393        | 460        | 536        | 614        | 705        | 825        | 16%            |
| - Electronic Information Svcs   | 120        | 17%              | 140        | 163        | 187        | 214        | 240        | 280        | 15%            |
| - Network Applications          | 214        | 18%              | 253        | 297        | 349        | 400        | 465        | 545        | 17%            |
| <b>Applications SW Products</b> | 885        | 12%              | 992        | 1,115      | 1,256      | 1,421      | 1,613      | 1,836      | 13%            |
| - Mainframe                     | 213        | 6%               | 226        | 236        | 246        | 257        | 268        | 281        | 4%             |
| - Minicomputer                  | 252        | 6%               | 266        | 281        | 295        | 310        | 325        | 335        | 5%             |
| - Workstation/PC                | 420        | 19%              | 500        | 598        | 715        | 854        | 1,020      | 1,220      | 20%            |
| <b>Systems SW Products</b>      | 790        | 9%               | 864        | 936        | 1,016      | 1,100      | 1,197      | 1,305      | 9%             |
| - Mainframe                     | 348        | 6%               | 368        | 379        | 391        | 400        | 409        | 417        | 3%             |
| - Minicomputer                  | 252        | 7%               | 270        | 285        | 299        | 312        | 325        | 335        | 4%             |
| - Workstation/PC                | 190        | 19%              | 226        | 272        | 326        | 388        | 463        | 553        | 20%            |
| <b>Turnkey Systems</b>          | 350        | 5%               | 366        | 384        | 402        | 421        | 436        | 454        | 4%             |
| - Equipment                     | 109        | 4%               | 113        | 117        | 121        | 125        | 127        | 129        | 3%             |
| - Software Products             | 198        | 5%               | 207        | 218        | 228        | 238        | 247        | 258        | 5%             |
| - Professional Services         | 43         | 7%               | 46         | 49         | 53         | 58         | 62         | 67         | 8%             |

Source: INPUT







# Worldwide

## Information Services Program

COUNTRY PROFILE

NORTH AMERICA

## Mexico

September 1996

### Economic Overview

Mexico is the third largest importer of U.S. goods, after Japan and Canada, with the U.K. a distant fourth. The December 1994 devaluation of the peso, although having some initial negative effects—most notably concerns by foreign investors—has improved the marketability of Mexican goods in world markets and should lead to a reduction in Mexico's trade deficit. In spite of the devaluation, however, Mexico has continued to meet its NAFTA commitments, and has implemented a multistep program to stabilize its economy. These steps include controls on credit, tax increases and reduced government spending. Plans for 1995 were to reduce the current account deficit from \$28 billion to \$2 billion—a step that is being implemented by a strong move toward privatization. Government activities scheduled to move to the private sector include satellite communications, ports, airports, petrochemical plants, toll highways, railroad lines, and international long-distance telephone service. These steps are viewed as not only strong steps towards deficit reduction, but also opportunities for foreign investment. Although there will almost certainly be short-term perturbations, long term Mexico is moving aggressively to not only strengthen and expand its economy, but also meet its global (e.g., World Trade Organization), NAFTA, and other Latin American partnership obligations.

*Economic Indicators* - The effects of the December 1994 devaluation of the peso were about as expected: Real GDP in 1995 dropped to -7.0% from 3.5% in 1994 and inflation, driven by uncertainties regarding the peso, went from 7.1% in 1994 to 52% in 1995, but will decrease steadily and is expected to be 31% in 1996, 24% in 1997, and 20% in 1998. Unemployment, at 9.8% in 1994, and despite a loss of one million jobs in 1995 as a result of the uncertain economy following devaluation of the peso, declined steadily in 1995 and was officially at 5.2% in December. However, approximately 20% of the labor force is now “underemployed”—that is, works less than 35 hours per week.

Key Mexican economic indicators are summarized in Exhibit 1.

Exhibit 1

1995 Key Economic Indicators—Mexico

| Indicator                  | Value |
|----------------------------|-------|
| GDP Growth Rate            |       |
| - 1995                     | -7.0% |
| - 1996                     | 2.0%  |
| Inflation Rate (1995-2000) | 26.0% |
| Unemployment Rate (1994)   | 9.8%  |
| Exchange Rate (per U.S.\$) | 7.58  |

Sources: GDP and Inflation - BofA World Information Services, 1996  
CIA World Factbook, 1995  
Exchange Rate: Wall Street Journal, 6/96

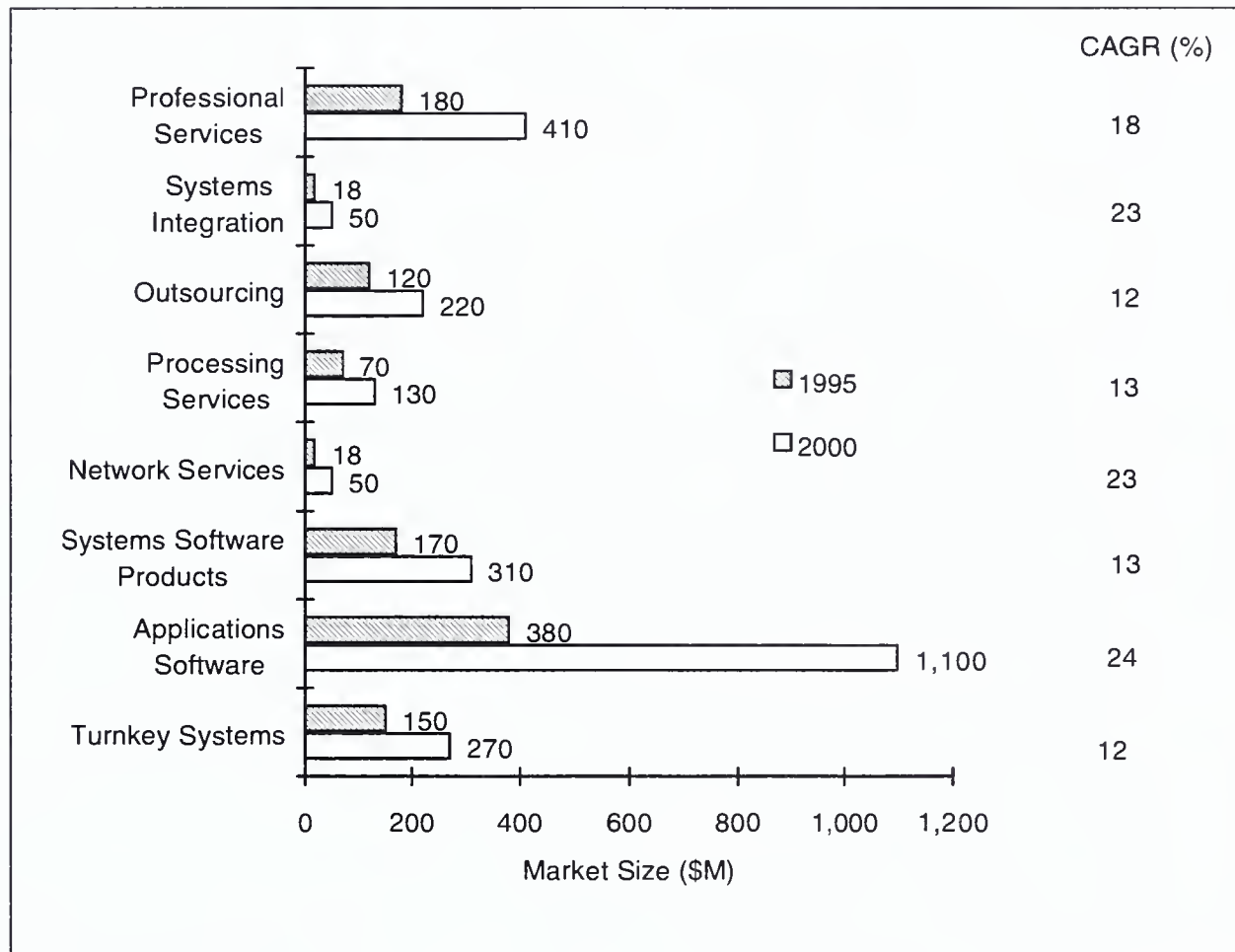
*Business Environment* - The business climate in Mexico, as reflected in the more than 10% negative change in GDP, was uncertain in 1995 and will remain difficult in 1996. Causal factors include continued high interest rates, tight credit, and a weak domestic recovery—all of which will squeeze profit margins. The year 1996 will be regarded as a restructuring year, with a growing number of joint ventures with foreign partners, increased privatization opening new business opportunities—and a steady flow of foreign capital to lubricate and facilitate change. As the economy continues to stabilize through 2000—a result of the government’s programs and the stimulus of foreign investment—a more stable, growing Mexican economy will be seen, as demonstrated by increased GDP growth, reduced inflation, higher employment levels, reduced government deficits, and improved trade balances, especially with NAFTA partners. Industry sectors expected to see the most growth through 2000 include auto parts, pollution control, and telecommunications.

Information Services Market Forecast

Exhibit 2 summarizes INPUT’s market forecast for Mexico for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in billions of U.S.\$\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

## Exhibit 2

### Market Forecast by Product/Service Category Mexico, 1995 - 2000



Numbers are rounded.

Source: INPUT

Mexico's information services market will grow at an 18% rate through 2000—up 3% from the five-year compound annual growth rate (CAGR) for that country (15%) in the 1994-1999 Worldwide report, and 2% above the U.S.'s 14% for 1995-2000. The 7% drop in GDP in 1995 (resulting from the peso devaluation in December 1994) was factored into the overall information services growth from 1994 to 1995, yielding a 12% increase for that period—down from the 1993-1994 growth estimate of 22%. As 1995 progressed, the Mexican economy strengthened and business confidence and spending increased accordingly, with the effect that information services growth, although nearly \$20 million higher than anticipated, still yielded the 12% originally projected for 1995. Growth through 2000 will be at a CAGR of 18%, with marginal increases each year to a 20% going rate in 2000 (e.g., the 1999 to 2000 growth rate).

Outsourcing and network services will grow more rapidly than anticipated, as Mexican business seeks more efficient, cost-fixed IT solutions and privatization increases both the



quality and demographics of the Mexican telecommunications network. With better delivery mechanisms and the pressures of global competition in foreign markets (made attractive by the devalued peso), electronic information services—especially those related to business data and the Internet—will grow at a rapid pace. Outsourcing growth for the period 1995-2000 will be at a 12% CAGR, up 2% from last year's estimate of 10%. Network services growth rate will almost double, from 13% for 1994-1999 to 23% for 1995-2000. Privatization and Mexico's plan to have a world-class telecommunications infrastructure, along with the impact of the Internet, client/server architecture, the intranet possibilities of the Internet, the general move toward more on-line data and information, and more sophisticated telecommunications solutions, are all providing a strong impetus for the dramatic increase in growth.

Professional services and systems integration will grow at more aggressive levels than before as the complexities of the growing Mexican computer environment require the guidance, analysis, and management services they provide. Professional services spending growth will be up by 20%—from a 15% CAGR to 18%—while SI growth will increase from a 19% CAGR in 1994 to 23% for the period 1995-2000.

Software products have been estimated by other sources to be a \$400 million market in Mexico in 1994, growing at about 25% over the next few years. In its 1994-1999 forecast, INPUT estimated the combined systems and applications software products market for Mexico at \$455 million in 1994, growing to \$1 billion in 1999 at a 17% CAGR. The return of stability and growth to the Mexican economy will stimulate the sales of packaged software solutions and INPUT now estimates the 1995-2000 growth to be 4% higher, or 21% for the five-year period for combined sales of applications and systems software. U.S. sales into this market represent about 75% of the total.

Turnkey systems will continue moderate growth in the 11-12% range, while processing services, heavily affected by the loss of 1 million jobs in 1995 and tighter credit restrictions, still managed a respectable 4% growth from 1994 to 1995—down from the 13% estimated by INPUT in the 1994-1999 forecast. Renewed economic vigor and dwindling unemployment will help to increase use of payroll, HR, and other traditional processing services applications, while the growing use in Mexico of billing systems for telecommunications services and Internet activity will account for new transaction processing activity and yield an overall 13% CAGR for processing services through 2000—up from the 11% estimated for 1994-1999.

## Leading Software and Services Vendors

The following table (Exhibit 3) shows a selection of United States software and services vendors doing business in Mexico. The listing is representative, and not intended to identify all major vendors or all markets in which they participate. Major areas of activity are noted by an "X."

Exhibit 3

**Representative US-Based Software and Services Vendors—Mexico, 1995**

| Company Name             | Provides |          |
|--------------------------|----------|----------|
|                          | Services | Software |
| IBM                      | X        | X        |
| Digital                  | X        | X        |
| Andersen Consulting      | X        |          |
| EDS                      | X        |          |
| Computer Associates      |          | X        |
| Centura (formerly Gupta) |          | X        |
| Informix                 |          | X        |
| Microsoft                |          | X        |
| Novell                   |          | X        |
| Oracle                   |          | X        |
| Sybase                   |          | X        |

Source: INPUT

Mexico-based software and services companies are also factors in Mexico's information services market. Exhibit 4 notes a representative sample of Mexico's information services and software companies and, as with Exhibit 3, notes areas in which they conduct their primary activities.

Domestic software production in Mexico is estimated at \$18 million in 1995, against a systems and applications software market of \$550 million. An estimated 250 to 300 software developers are headquartered in Mexico, all of them comparatively small compared to most U.S. and European software developers, and their efforts are concentrated mainly on educational and accounting applications. This emphasis is due, in part, to the fact that almost half of these developers are connected in some way with Mexican educational institutions, and educational software development is a logical extension of their activities. Accounting software is ubiquitous, usable at all levels of business, and offers leverage opportunities for standard, native-language applications created by local developers.

Exhibit 4

Representative Mexican Software and Services Vendors—1995

| Company Name   | Provides .<br>Services   Software |
|--|-----------------------------------|
| Ecomsa   | X                                 |
| Grupo Tea  | X                                 |
| Infogama   | X                                 |
| SAS Institute  | X                                 |
| Servicios y Asesoría Integral<br>en Telecomunicaciones | X                                 |
| Distribuidor de Computo*                               | X                                 |
| Central del Software*                                  | X                                 |

\* Software distributors

Source: INPUT

IT Spending

Industry privatization will be a major factor stimulating the growth of IT spending in the Mexican market. This will be the result of these new—and in most cases very large—businesses applying the efficiencies, management controls and data management attributes of IT to the restructuring and management of these new enterprises. In addition, the planned improvements in Mexico’s telecommunications infrastructure will provide the groundwork for business communications applications. The growing number of sophisticated foreign investors in Mexican businesses bring with them expectations of equally sophisticated information systems that will allow them to monitor the status of the companies in which they have invested.

Exhibit 5 notes the Mexican industries expected to experience strong growth over the next five years.

Exhibit 5

Fastest Growing Mexican Industry Sectors—1995-2000

|  |
|--|
| • Financial services industry (including insurance companies, brokerage firms, and commercial banks) |
| • The federal government   |
| • Discrete and process manufacturing industries  |
| • Retailer and wholesale industry  |

Source: U.S. Department of Commerce and INPUT

The following table (Exhibit 6) offers INPUT's estimate of IT spending in Mexico. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy) costs, and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

Exhibit 6

### 1995 IT Spending—Mexico

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 340                                 | 6                      |
| Internal Staff           | 1,450                               | 26                     |
| Equipment                | 1,550                               | 27                     |
| Equipment Services       | 530                                 | 9                      |
| Facilities               | 680                                 | 12                     |
| Information Services     | 1,100                               | 20                     |
| <b>Total IT Spending</b> | <b>5,650</b>                        | <b>100</b>             |

*Numbers are rounded.*

*Source: INPUT*

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 7) for Mexico, for the period 1995-2000.



## Exhibit 7

### Information Services Market Mexico, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 989        | 12%          | 1,111      | 1,280      | 1,497      | 1,771      | 2,118      | 2,552      | 18%        |
| <b>Professional Services</b>    | 165        | 9%           | 180        | 206        | 238        | 279        | 335        | 408        | 18%        |
| - IS Consulting                 | 70         | 14%          | 80         | 91         | 105        | 123        | 147        | 178        | 17%        |
| - Education & Training          | 15         | 0%           | 15         | 15         | 16         | 18         | 20         | 22         | 8%         |
| - Software Development          | 80         | 6%           | 85         | 100        | 117        | 138        | 168        | 208        | 20%        |
| <b>Systems Integration</b>      | 17         | 6%           | 18         | 22         | 27         | 34         | 42         | 50         | 23%        |
| - Equipment                     | 5          | 0%           | 5          | 6          | 8          | 10         | 13         | 16         | 26%        |
| - Software Products             | 2          | 0%           | 2          | 3          | 3          | 4          | 5          | 6          | 25%        |
| - Professional Services         | 9          | 11%          | 10         | 12         | 15         | 18         | 22         | 26         | 21%        |
| - Other                         | 1          | 0%           | 1          | 1          | 1          | 2          | 2          | 2          | 15%        |
| <b>Outsourcing</b>              | 113        | 7%           | 121        | 132        | 147        | 165        | 188        | 218        | 12%        |
| - Platform Operations           | 69         | 6%           | 73         | 79         | 87         | 97         | 109        | 123        | 11%        |
| - Applications Operations       | 44         | 9%           | 48         | 53         | 60         | 68         | 79         | 95         | 15%        |
| <b>Processing Services</b>      | 70         | 4%           | 73         | 79         | 88         | 100        | 114        | 133        | 13%        |
| - Transaction Processing        | 39         | 3%           | 40         | 44         | 51         | 60         | 72         | 88         | 17%        |
| - Utility Processing            | 26         | 4%           | 27         | 28         | 29         | 30         | 30         | 31         | 3%         |
| - Other Processing              | 5          | 20%          | 6          | 7          | 8          | 10         | 12         | 14         | 18%        |
| <b>Network Services</b>         | 15         | 20%          | 18         | 21         | 26         | 32         | 40         | 51         | 23%        |
| - Electronic Information Svcs   | 12         | 17%          | 14         | 16         | 19         | 23         | 28         | 35         | 20%        |
| - Network Applications          | 3          | 33%          | 4          | 5          | 7          | 9          | 12         | 16         | 32%        |
| <b>Applications SW Products</b> | 319        | 20%          | 382        | 463        | 570        | 710        | 890        | 1,120      | 24%        |
| <b>Systems SW Products</b>      | 144        | 15%          | 165        | 186        | 212        | 242        | 273        | 305        | 13%        |
| <b>Turnkey Systems</b>          | 146        | 5%           | 154        | 171        | 189        | 209        | 236        | 267        | 12%        |
| - Equipment                     | 58         | 3%           | 60         | 64         | 69         | 74         | 80         | 86         | 7%         |
| - Software Products             | 33         | 6%           | 35         | 40         | 44         | 48         | 52         | 55         | 9%         |
| - Professional Services         | 55         | 7%           | 59         | 67         | 76         | 87         | 104        | 126        | 16%        |

Source: INPUT



# Worldwide

## Information Services Program

COUNTRY PROFILE

NORTH AMERICA

## United States

### Economic Overview

1995 was a year of strong growth for the U.S. economy—a growth reflected in the record performance of stocks on the NYSE and NASDAQ. The 3.2% real GDP growth seen in 1995 is expected to decline to a more conservative 2.0% in 1996, mirroring the slightly less than 2% performance seen in the final quarter of 1995. Inflation will climb from a low 2.6% in 1995 to 2.9% in 1996, and average 3.0% for the balance of the millennium. Unemployment was 5.6% in 1995 and is expected to increase slightly over the next two years to 5.9% in 1997. This statistical data is summarized in Exhibit 1. Overall, the U.S. economy is expected to continue a somewhat slower but steady growth for the balance of this decade. This growth is driven in part by the business cost cutting and restructuring that has taken place in recent years. These changes are now beginning to pay off as American manufacturers are more competitive in global markets than they have been for a generation. Federal budget problems continue to plague the Clinton administration, and with 1996 an election year, further efforts will almost certainly be seen to boost consumer and business confidence in the U.S. economy.

#### Exhibit 1

#### 1995 Key Economic Indicators—United States

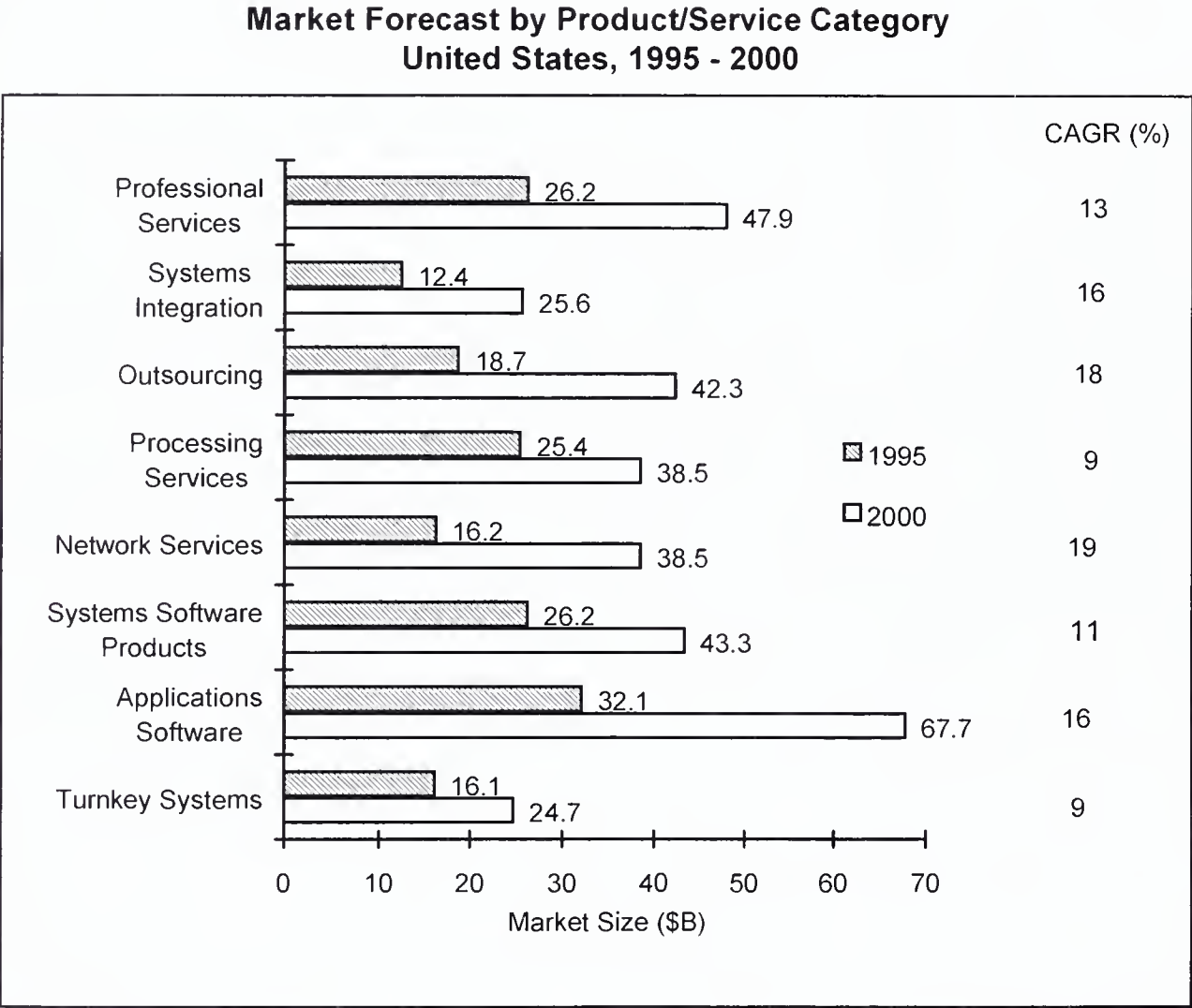
| Indicator         | Value |
|-------------------|-------|
| GDP Growth Rate   |       |
| - 1995            | 5.8%  |
| - 1996            | 4.9%  |
| Inflation Rate    | 2.6%  |
| Unemployment Rate | 5.6%  |

Sources: GDP and Inflation - BofA World Information Services, 1996  
Unemployment Rate - IMF World Economic Outlook, 1996

Information Services Market Forecast

Exhibit 2 summarizes INPUT’s market forecast for the eight information services categories for the years 1995 and 2000, including the five-year compound annual growth rate (CAGR) percentage, in billions of U.S.\$. A detailed forecast of the components of each product/service category is provided in the Forecast Database section.

Exhibit 2



Numbers are rounded.

Source: INPUT

INPUT forecasts that the United States market for information services will grow over the next five years at a rate of 14% per annum. This strong growth is being driven by increasing use of network services (19% CAGR for the period 1995-2000), outsourcing (18% CAGR), systems integration (16% CAGR) and applications software products (16% CAGR). The strong growth of the American economy in 1995 was reflected in increased spending for the information services and products that support business’ increasing trend toward



returning to core competencies and seeking outside support in such areas as information technology. In the rapidly moving world of computer and telecommunications technology, more and more U.S. companies seek to fix costs, insure technological currency, and have guaranteed access to expert support by using information services.

Outsourcing contracts grew 19% in 1995 from the previous year and the 18% CAGR projected through 2000 is the second highest for all U.S. information services. As an example of the magnitude of the contract awards, INPUT's outsourcing database records 21 contracts in 1995 with values of \$200 million or more for periods ranging from five to ten years. More than half of these contracts were for applications operations management. The balance were for business operations and network management and desktop services support. Outsourcing activities are expected to continue at an aggressive pace through 2000, as more and more companies seek expert support for IT activities. The three fastest growing segments of outsourcing services are business operations (30% five-year CAGR), network management (25% CAGR) and desktop services (24% CAGR). Applications operations will remain the largest segment, accounting for 38% of the outsourcing market in the year 2000—down slightly from 41% in 1995.

Network services are starting to feel the effects of user expectations that virtually any type of information is (or should be) available on-line—a concept being driven by the phenomenal growth of the Internet and Internet-related services. Overall growth for this service category is a 19% CAGR through 2000, up from 17% from 1994 to 1995. Systems integration (SI) services grew at a healthy 11% in 1995 and as more and more businesses seek expert assistance for platform, application or technical migrations or changes, SI will grow at a 16% CAGR through 2000. Professional services and equipment will continue to be the dominant components of systems integration activities, together accounting for almost 90% of total SI contract spending over the next five years.

The overall growth of systems software products remains steady at 11%, while the workstation/PC segment continues to grow at an aggressive 20% CAGR for the period 1995-2000. Applications software product growth is somewhat higher, at a 16% CAGR, and is also driven by product demands for workstation and PC platforms. By 2000, the workstation/PC applications software market will be the largest information services market subsegment, and represent almost 15% of the total U.S. market.

The strongest growth in the professional services market will be for IS consulting (15% CAGR), while the largest subsector in 2000 will be software development. Overall, professional services will grow at 13%, or slightly below the overall U.S. information services market. Both processing services and turnkey systems have a 1995-2000 CAGR of 9%—and both, at one time or another, were considered obsolete technologies. Processing services usage will be supported by the stability of traditional activities such as credit card



processing and payroll, but renewed growth will be driven by new applications based upon the distributed nature of the Internet, and the needs of vendors that will require a transaction clearing-house for order processing or payment. Turnkey systems, once a rigid marriage of standard hardware and software products, now is benefiting from the increasing use of vendor-based professional services to modify and enhance basic products. This is occurring because the functions performed by many turnkey systems don't migrate easily to other processing environments (e.g., network, client/server) and, as a result, the integrated systems are finding new life.

Leading Software and Services Vendors

The following table (Exhibit 3) notes the leading U.S. software and services vendors. The table offers a ranking, the vendor's name, and INPUT's estimate of market share for that vendor. The rankings and market share estimates are based upon 1995 vendor revenues.

Exhibit 3

Leading Software and Services Vendors—United States, 1995

| Ranking | Company Name        | Market Share (%) |
|---------|---------------------|------------------|
| 1       | IBM                 | 6.6              |
| 2       | EDS                 | 3.3              |
| 3=      | Microsoft           | 1.8              |
| 3=      | CSC                 | 1.8              |
| 5       | Andersen Consulting | 1.2              |
| 6=      | Computer Associates | 0.7              |
| 6=      | Digital Equipment   | 0.7              |
| 8=      | Unisys              | 0.6              |
| 8=      | Oracle              | 0.6              |
| 8=      | Hewlett-Packard     | 0.6              |

Source: INPUT

As determined by their major activity, the list of leading information services and software vendors includes four hardware manufacturers who also offer a broad range of software products and services—especially IBM, through its ISSC subsidiary; three software providers (Microsoft, Computer Associates, and Oracle); two outsourcers (EDS and CSC); and one professional services firm (Andersen). The majority of these firms have headed similar lists for a number of years and will continue to do so through the millennium. Of note, in terms of sheer magnitude, are the outsourcing contracts many of these firms

received in 1995. Multiple contracts, each for \$200 million or more, were awarded to CSC, EDS, IBM (ISSC), and Andersen. The result—these four firms are in the top five vendors.

## IT Spending

IT spending increased 6% in 1995, as a healthy U.S. economy loosened corporate purse strings; a similar increase is expected in 1996. The following table (Exhibit 4) offers INPUT's estimate of IT spending in the United States. Spending is segmented into six categories—data communications, internal staff, equipment, equipment services, facility (or occupancy costs), and information services spending. Both dollar amounts (in U.S.\$ millions) and percent of total IT spending are shown for each category. The IT “equipment” category does not include the equipment components of turnkey systems or systems integration contracts. These amounts are contained in the “equipment” subcategories of their respective information services product/service categories and are identified in the following section, Forecast Database.

Exhibit 4

### 1995 IT Spending—United States

| Budget Category          | Estimated Spending<br>(\$ Millions) | % of Total IT Spending |
|--------------------------|-------------------------------------|------------------------|
| Data Communications      | 57,800                              | 9                      |
| Internal Staff           | 211,900                             | 33                     |
| Equipment                | 122,000                             | 19                     |
| Equipment Services       | 32,100                              | 5                      |
| Facilities               | 44,950                              | 7                      |
| Information Services     | 173,350                             | 27                     |
| <b>Total IT Spending</b> | <b>642,100</b>                      | <b>100</b>             |

Numbers are rounded.

Source: INPUT

## Information Services Forecast Database

This section contains the complete information services forecast database (Exhibit 5) for the United States, for the period 1995-2000.

Exhibit 5

## Information Services Market United States, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M)    | Growth 94-95 (%) | 1995 (\$M)    | 1996 (\$M)    | 1997 (\$M)    | 1998 (\$M)    | 1999 (\$M)    | 2000 (\$M)    | CAGR 95-00 (%) |
|---------------------------------|---------------|------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| <b>COUNTRY TOTAL</b>            | <b>154026</b> | <b>13%</b>       | <b>173348</b> | <b>195908</b> | <b>221976</b> | <b>251748</b> | <b>286947</b> | <b>328419</b> | <b>14%</b>     |
| <b>Professional Services</b>    | 23101         | 13%              | 26184         | 29427         | 33332         | 37619         | 42481         | 47898         | 13%            |
| - IS Consulting                 | 5982          | 16%              | 6950          | 7986          | 9234          | 10675         | 12312         | 14192         | 15%            |
| - Education & Training          | 3492          | 12%              | 3915          | 4402          | 4957          | 5583          | 6296          | 7114          | 13%            |
| - Software Development          | 13627         | 12%              | 15319         | 17039         | 19141         | 21361         | 23873         | 26592         | 12%            |
| <b>Systems Integration</b>      | 11235         | 11%              | 12417         | 14639         | 16849         | 19366         | 22252         | 25578         | 16%            |
| - Equipment                     | 5067          | 9%               | 5514          | 6562          | 7422          | 8376          | 9407          | 10589         | 14%            |
| - Software Products             | 899           | 11%              | 1002          | 1202          | 1372          | 1563          | 1790          | 2055          | 15%            |
| - Professional Services         | 4849          | 12%              | 5429          | 6307          | 7414          | 8704          | 10231         | 11999         | 17%            |
| - Other                         | 420           | 12%              | 472           | 568           | 641           | 723           | 824           | 935           | 15%            |
| <b>Outsourcing</b>              | 15740         | 19%              | 18664         | 21785         | 25619         | 30170         | 35651         | 42297         | 18%            |
| - Platform Operations           | 4542          | 12%              | 5083          | 5639          | 6283          | 6951          | 7645          | 8404          | 11%            |
| - Applications Operations       | 6353          | 21%              | 7668          | 8878          | 10329         | 12003         | 13961         | 16234         | 16%            |
| - Desktop Services              | 1802          | 22%              | 2192          | 2686          | 3315          | 4092          | 5080          | 6322          | 24%            |
| - Network Management            | 1737          | 22%              | 2117          | 2603          | 3224          | 4031          | 5065          | 6382          | 25%            |
| - Application Managem't         | 703           | 20%              | 841           | 1004          | 1203          | 1439          | 1725          | 2072          | 20%            |
| - Business Operations           | 603           | 27%              | 763           | 975           | 1265          | 1654          | 2175          | 2883          | 30%            |
| <b>Processing Services</b>      | 23415         | 9%               | 25425         | 27538         | 29921         | 32452         | 35331         | 38506         | 9%             |
| - Transaction Processing        | 18320         | 7%               | 19581         | 20877         | 22310         | 23746         | 25351         | 27056         | 7%             |
| - Utility Processing            | 1085          | 4%               | 1132          | 1171          | 1211          | 1251          | 1290          | 1325          | 3%             |
| - Other Processing              | 4010          | 18%              | 4712          | 5490          | 6400          | 7455          | 8690          | 10125         | 17%            |
| <b>Network Services</b>         | 13906         | 17%              | 16235         | 19137         | 22732         | 26977         | 32193         | 38479         | 19%            |
| - Electronic Information Svcs   | 11210         | 17%              | 13068         | 15419         | 18268         | 21609         | 25652         | 30481         | 18%            |
| - Network Applications          | 2696          | 17%              | 3167          | 3718          | 4464          | 5368          | 6541          | 7998          | 20%            |
| <b>Applications SW Products</b> | 28003         | 15%              | 32111         | 36998         | 42724         | 49451         | 57642         | 67655         | 16%            |
| - Mainframe                     | 5907          | 7%               | 6305          | 6734          | 7171          | 7615          | 8093          | 8639          | 7%             |
| - Minicomputer                  | 6904          | 9%               | 7517          | 8179          | 8864          | 9583          | 10379         | 11257         | 8%             |
| - Workstation/PC                | 15192         | 20%              | 18289         | 22085         | 26689         | 32253         | 39170         | 47759         | 21%            |
| <b>Systems SW Products</b>      | 23845         | 10%              | 26212         | 28753         | 31618         | 34876         | 38735         | 43290         | 11%            |
| - Mainframe                     | 9475          | 2%               | 9688          | 9798          | 9810          | 9744          | 9685          | 9584          | 0%             |
| - Minicomputer                  | 7591          | 8%               | 8235          | 8922          | 9699          | 10578         | 11627         | 12820         | 9%             |
| - Workstation/PC                | 6779          | 22%              | 8289          | 10033         | 12109         | 14554         | 17423         | 20886         | 20%            |
| <b>Turnkey Systems</b>          | 14781         | 9%               | 16100         | 17631         | 19181         | 20837         | 22662         | 24716         | 9%             |
| - Equipment                     | 6152          | 6%               | 6516          | 6946          | 7333          | 7736          | 8167          | 8631          | 6%             |
| - Software Products             | 5685          | 10%              | 6245          | 6873          | 7539          | 8247          | 9011          | 9852          | 10%            |
| - Professional Services         | 2944          | 13%              | 3339          | 3812          | 4309          | 4854          | 5484          | 6233          | 13%            |





## Information Services Market Forecast United States, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 154,026    | 13%          | 173,348    | 195,908    | 221,976    | 251,748    | 286,947    | 328,419    | 14%        |
| <b>Professional Services</b>    | 23,101     | 13%          | 26,184     | 29,427     | 33,332     | 37,619     | 42,481     | 47,898     | 13%        |
| - IS Consulting                 | 5,982      | 16%          | 6,950      | 7,986      | 9,234      | 10,675     | 12,312     | 14,192     | 15%        |
| - Education & Training          | 3,492      | 12%          | 3,915      | 4,402      | 4,957      | 5,583      | 6,296      | 7,114      | 13%        |
| - Software Development          | 13,627     | 12%          | 15,319     | 17,039     | 19,141     | 21,361     | 23,873     | 26,592     | 12%        |
| <b>Systems Integration</b>      | 11,235     | 11%          | 12,417     | 14,639     | 16,849     | 19,366     | 22,252     | 25,578     | 16%        |
| - Equipment                     | 5,067      | 9%           | 5,514      | 6,562      | 7,422      | 8,376      | 9,407      | 10,589     | 14%        |
| - Software Products             | 899        | 11%          | 1,002      | 1,202      | 1,372      | 1,563      | 1,790      | 2,055      | 15%        |
| - Professional Services         | 4,849      | 12%          | 5,429      | 6,307      | 7,414      | 8,704      | 10,231     | 11,999     | 17%        |
| - Other                         | 420        | 12%          | 472        | 568        | 641        | 723        | 824        | 935        | 15%        |
| <b>Outsourcing</b>              | 15,740     | 19%          | 18,664     | 21,785     | 25,619     | 30,170     | 35,651     | 42,297     | 18%        |
| - Platform Operations           | 4,542      | 12%          | 5,083      | 5,639      | 6,283      | 6,951      | 7,645      | 8,404      | 11%        |
| - Applications Operations       | 6,353      | 21%          | 7,668      | 8,878      | 10,329     | 12,003     | 13,961     | 16,234     | 16%        |
| - Desktop Services              | 1,802      | 22%          | 2,192      | 2,686      | 3,315      | 4,092      | 5,080      | 6,322      | 24%        |
| - Network Management            | 1,737      | 22%          | 2,117      | 2,603      | 3,224      | 4,031      | 5,065      | 6,382      | 25%        |
| - Application Managem't         | 703        | 20%          | 841        | 1,004      | 1,203      | 1,439      | 1,725      | 2,072      | 20%        |
| - Business Operations           | 603        | 27%          | 763        | 975        | 1,265      | 1,654      | 2,175      | 2,883      | 30%        |
| <b>Processing Services</b>      | 23,415     | 9%           | 25,425     | 27,538     | 29,921     | 32,452     | 35,331     | 38,506     | 9%         |
| - Transaction Processing        | 18,320     | 7%           | 19,581     | 20,877     | 22,310     | 23,746     | 25,351     | 27,056     | 7%         |
| - Utility Processing            | 1,085      | 4%           | 1,132      | 1,171      | 1,211      | 1,251      | 1,290      | 1,325      | 3%         |
| - Other Processing              | 4,010      | 18%          | 4,712      | 5,490      | 6,400      | 7,455      | 8,690      | 10,125     | 17%        |
| <b>Network Services</b>         | 13,906     | 17%          | 16,235     | 19,137     | 22,732     | 26,977     | 32,193     | 38,479     | 19%        |
| - Electronic Information Svcs   | 11,210     | 17%          | 13,068     | 15,419     | 18,268     | 21,609     | 25,652     | 30,481     | 18%        |
| - Network Applications          | 2,696      | 17%          | 3,167      | 3,718      | 4,464      | 5,368      | 6,541      | 7,998      | 20%        |
| <b>Applications SW Products</b> | 28,003     | 15%          | 32,111     | 36,998     | 42,724     | 49,451     | 57,642     | 67,655     | 16%        |
| - Mainframe                     | 5,907      | 7%           | 6,305      | 6,734      | 7,171      | 7,615      | 8,093      | 8,639      | 7%         |
| - Minicomputer                  | 6,904      | 9%           | 7,517      | 8,179      | 8,864      | 9,583      | 10,379     | 11,257     | 8%         |
| - Workstation/PC                | 15,192     | 20%          | 18,289     | 22,085     | 26,689     | 32,253     | 39,170     | 47,759     | 21%        |
| <b>Systems SW Products</b>      | 23,845     | 10%          | 26,212     | 28,753     | 31,618     | 34,876     | 38,735     | 43,290     | 11%        |
| - Mainframe                     | 9,475      | 2%           | 9,688      | 9,798      | 9,810      | 9,744      | 9,685      | 9,584      | 0%         |
| - Minicomputer                  | 7,591      | 8%           | 8,235      | 8,922      | 9,699      | 10,578     | 11,627     | 12,820     | 9%         |
| - Workstation/PC                | 6,779      | 22%          | 8,289      | 10,033     | 12,109     | 14,554     | 17,423     | 20,886     | 20%        |
| <b>Turnkey Systems</b>          | 14,781     | 9%           | 16,100     | 17,631     | 19,181     | 20,837     | 22,662     | 24,716     | 9%         |
| - Equipment                     | 6,152      | 6%           | 6,516      | 6,946      | 7,333      | 7,736      | 8,167      | 8,631      | 6%         |
| - Software Products             | 5,685      | 10%          | 6,245      | 6,873      | 7,539      | 8,247      | 9,011      | 9,852      | 10%        |
| - Professional Services         | 2,944      | 13%          | 3,339      | 3,812      | 4,309      | 4,854      | 5,484      | 6,233      | 13%        |











## Information Services Market North America, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>REGIONAL TOTAL</b>           | 162,439    | 13%              | 183,090    | 207,031    | 234,751    | 266,408    | 303,907    | 348,061    | 14%            |
| <b>Professional Services</b>    | 24,739     | 13%              | 28,010     | 31,470     | 35,623     | 40,178     | 45,356     | 51,126     | 13%            |
| <b>Systems Integration</b>      | 12,166     | 10%              | 13,440     | 15,765     | 18,091     | 20,741     | 23,804     | 27,288     | 15%            |
| <b>Outsourcing</b>              | 17,748     | 20%              | 21,311     | 25,024     | 29,600     | 35,019     | 41,578     | 49,526     | 18%            |
| <b>Processing Services</b>      | 24,268     | 9%               | 26,337     | 28,517     | 30,975     | 33,580     | 36,547     | 39,818     | 9%             |
| <b>Network Services</b>         | 14,255     | 17%              | 16,646     | 19,618     | 23,294     | 27,623     | 32,938     | 39,355     | 19%            |
| <b>Applications SW Products</b> | 29,207     | 15%              | 33,485     | 38,576     | 44,550     | 51,582     | 60,145     | 70,611     | 16%            |
| <b>Systems SW Products</b>      | 24,779     | 10%              | 27,241     | 29,875     | 32,846     | 36,218     | 40,205     | 44,900     | 11%            |
| <b>Turnkey Systems</b>          | 15,277     | 9%               | 16,620     | 18,186     | 19,772     | 21,467     | 23,334     | 25,437     | 9%             |







## Information Services Market Canada, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 7,424      | 16%          | 8,631      | 9,843      | 11,278     | 12,889     | 14,842     | 17,090     | 15%        |
| <b>Professional Services</b>    | 1,473      | 12%          | 1,646      | 1,837      | 2,053      | 2,280      | 2,540      | 2,820      | 11%        |
| - IS Consulting                 | 541        | 13%          | 611        | 690        | 780        | 870        | 975        | 1,085      | 12%        |
| - Education & Training          | 266        | 12%          | 298        | 333        | 373        | 415        | 465        | 520        | 12%        |
| - Software Development          | 666        | 11%          | 737        | 814        | 900        | 995        | 1,100      | 1,215      | 11%        |
| <b>Systems Integration</b>      | 914        | 10%          | 1,005      | 1,104      | 1,215      | 1,341      | 1,510      | 1,660      | 11%        |
| - Equipment                     | 358        | 8%           | 387        | 419        | 454        | 493        | 532        | 570        | 8%         |
| - Software Products             | 172        | 9%           | 187        | 203        | 222        | 244        | 272        | 302        | 10%        |
| - Professional Services         | 342        | 13%          | 387        | 435        | 490        | 552        | 651        | 731        | 14%        |
| - Other                         | 42         | 5%           | 44         | 47         | 49         | 52         | 55         | 57         | 5%         |
| <b>Outsourcing</b>              | 1,895      | 33%          | 2,526      | 3,107      | 3,834      | 4,684      | 5,739      | 7,011      | 23%        |
| - Platform Operations           | 900        | 39%          | 1,250      | 1,550      | 1,950      | 2,420      | 3,010      | 3,760      | 25%        |
| - Applications Operations       | 230        | 16%          | 267        | 311        | 362        | 420        | 489        | 560        | 16%        |
| - Desktop Services              | 210        | 22%          | 256        | 312        | 380        | 463        | 562        | 685        | 22%        |
| - Network Management            | 190        | 23%          | 233        | 289        | 352        | 431        | 528        | 646        | 23%        |
| - Business Operations           | 365        | 42%          | 520        | 645        | 790        | 950        | 1,150      | 1,360      | 21%        |
| <b>Processing Services</b>      | 783        | 7%           | 839        | 900        | 966        | 1,028      | 1,102      | 1,179      | 7%         |
| - Transaction Processing        | 483        | 8%           | 522        | 564        | 609        | 650        | 700        | 750        | 8%         |
| - Utility Processing            | 247        | 3%           | 255        | 264        | 272        | 280        | 287        | 294        | 3%         |
| - Other Processing              | 53         | 17%          | 62         | 72         | 85         | 98         | 115        | 135        | 17%        |
| <b>Network Services</b>         | 334        | 18%          | 393        | 460        | 536        | 614        | 705        | 825        | 16%        |
| - Electronic Information Svcs   | 120        | 17%          | 140        | 163        | 187        | 214        | 240        | 280        | 15%        |
| - Network Applications          | 214        | 18%          | 253        | 297        | 349        | 400        | 465        | 545        | 17%        |
| <b>Applications SW Products</b> | 885        | 12%          | 992        | 1,115      | 1,256      | 1,421      | 1,613      | 1,836      | 13%        |
| - Mainframe                     | 213        | 6%           | 226        | 236        | 246        | 257        | 268        | 281        | 4%         |
| - Minicomputer                  | 252        | 6%           | 266        | 281        | 295        | 310        | 325        | 335        | 5%         |
| - Workstation/PC                | 420        | 19%          | 500        | 598        | 715        | 854        | 1,020      | 1,220      | 20%        |
| <b>Systems SW Products</b>      | 790        | 9%           | 864        | 936        | 1,016      | 1,100      | 1,197      | 1,305      | 9%         |
| - Mainframe                     | 348        | 6%           | 368        | 379        | 391        | 400        | 409        | 417        | 3%         |
| - Minicomputer                  | 252        | 7%           | 270        | 285        | 299        | 312        | 325        | 335        | 4%         |
| - Workstation/PC                | 190        | 19%          | 226        | 272        | 326        | 388        | 463        | 553        | 20%        |
| <b>Turnkey Systems</b>          | 350        | 5%           | 366        | 384        | 402        | 421        | 436        | 454        | 4%         |
| - Equipment                     | 109        | 4%           | 113        | 117        | 121        | 125        | 127        | 129        | 3%         |
| - Software Products             | 198        | 5%           | 207        | 218        | 228        | 238        | 247        | 258        | 5%         |
| - Professional Services         | 43         | 7%           | 46         | 49         | 53         | 58         | 62         | 67         | 8%         |





## Information Services Market Mexico, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 |
|---------------------------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| <b>COUNTRY TOTAL</b>            | 989        | 12%          | 1,111      | 1,280      | 1,497      | 1,771      | 2,118      | 2,552      | 18%        |
| <b>Professional Services</b>    | 165        | 9%           | 180        | 206        | 238        | 279        | 335        | 408        | 18%        |
| - IS Consulting                 | 70         | 14%          | 80         | 91         | 105        | 123        | 147        | 178        | 17%        |
| - Education & Training          | 15         | 0%           | 15         | 15         | 16         | 18         | 20         | 22         | 8%         |
| - Software Development          | 80         | 6%           | 85         | 100        | 117        | 138        | 168        | 208        | 20%        |
| <b>Systems Integration</b>      | 17         | 6%           | 18         | 22         | 27         | 34         | 42         | 50         | 23%        |
| - Equipment                     | 5          | 0%           | 5          | 6          | 8          | 10         | 13         | 16         | 26%        |
| - Software Products             | 2          | 0%           | 2          | 3          | 3          | 4          | 5          | 6          | 25%        |
| - Professional Services         | 9          | 11%          | 10         | 12         | 15         | 18         | 22         | 26         | 21%        |
| - Other                         | 1          | 0%           | 1          | 1          | 1          | 2          | 2          | 2          | 15%        |
| <b>Outsourcing</b>              | 113        | 7%           | 121        | 132        | 147        | 165        | 188        | 218        | 12%        |
| - Platform Operations           | 69         | 6%           | 73         | 79         | 87         | 97         | 109        | 123        | 11%        |
| - Applications Operations       | 44         | 9%           | 48         | 53         | 60         | 68         | 79         | 95         | 15%        |
| <b>Processing Services</b>      | 70         | 4%           | 73         | 79         | 88         | 100        | 114        | 133        | 13%        |
| - Transaction Processing        | 39         | 3%           | 40         | 44         | 51         | 60         | 72         | 88         | 17%        |
| - Utility Processing            | 26         | 4%           | 27         | 28         | 29         | 30         | 30         | 31         | 3%         |
| - Other Processing              | 5          | 20%          | 6          | 7          | 8          | 10         | 12         | 14         | 18%        |
| <b>Network Services</b>         | 15         | 20%          | 18         | 21         | 26         | 32         | 40         | 51         | 23%        |
| - Electronic Information Svcs   | 12         | 17%          | 14         | 16         | 19         | 23         | 28         | 35         | 20%        |
| - Network Applications          | 3          | 33%          | 4          | 5          | 7          | 9          | 12         | 16         | 32%        |
| <b>Applications SW Products</b> | 319        | 20%          | 382        | 463        | 570        | 710        | 890        | 1,120      | 24%        |
| <b>Systems SW Products</b>      | 144        | 15%          | 165        | 186        | 212        | 242        | 273        | 305        | 13%        |
| <b>Turnkey Systems</b>          | 146        | 5%           | 154        | 171        | 189        | 209        | 236        | 267        | 12%        |
| - Equipment                     | 58         | 3%           | 60         | 64         | 69         | 74         | 80         | 86         | 7%         |
| - Software Products             | 33         | 6%           | 35         | 40         | 44         | 48         | 52         | 55         | 9%         |
| - Professional Services         | 55         | 7%           | 59         | 67         | 76         | 87         | 104        | 126        | 16%        |







## Information Services Market Latin America, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| REGIONAL TOTAL             | 4,763      | 15%              | 5,501      | 6,364      | 7,401      | 8,699      | 10,251     | 12,104     | 17%            |
| Professional Services      | 818        | 17%              | 955        | 1,105      | 1,282      | 1,506      | 1,789      | 2,123      | 17%            |
| Systems Integration        | 164        | 11%              | 182        | 204        | 232        | 266        | 302        | 345        | 14%            |
| Outsourcing                | 289        | 15%              | 331        | 379        | 435        | 502        | 578        | 670        | 15%            |
| Processing Services        | 334        | 8%               | 360        | 389        | 423        | 469        | 522        | 582        | 10%            |
| Network Services           | 160        | 13%              | 180        | 210        | 245        | 290        | 340        | 400        | 17%            |
| Applications SW Products   | 1,487      | 18%              | 1,759      | 2,082      | 2,487      | 2,996      | 3,609      | 4,356      | 20%            |
| Systems SW Products        | 870        | 15%              | 997        | 1,145      | 1,314      | 1,520      | 1,759      | 2,037      | 15%            |
| Turnkey Systems            | 641        | 15%              | 737        | 850        | 983        | 1,150      | 1,352      | 1,591      | 17%            |





## Information Services Market Argentina, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 813        | 17%              | 949        | 1,110      | 1,308      | 1,543      | 1,808      | 2,128      | 18%            |
| <b>Professional Services</b>    | 135        | 22%              | 165        | 201        | 245        | 295        | 355        | 429        | 21%            |
| - IS Consulting                 | 35         | 20%              | 42         | 50         | 60         | 70         | 85         | 100        | 19%            |
| - Education & Training          | 18         | 17%              | 21         | 26         | 30         | 35         | 40         | 49         | 18%            |
| - Software Development          | 82         | 24%              | 102        | 125        | 155        | 190        | 230        | 280        | 22%            |
| <b>Systems Integration</b>      | 55         | 15%              | 63         | 74         | 87         | 103        | 120        | 141        | 17%            |
| - Equipment                     | 15         | 13%              | 17         | 20         | 23         | 27         | 31         | 36         | 16%            |
| - Software Products             | 21         | 14%              | 24         | 28         | 34         | 40         | 48         | 57         | 19%            |
| - Professional Services         | 17         | 18%              | 20         | 23         | 27         | 32         | 37         | 44         | 17%            |
| - Other                         | 2          | 6%               | 2          | 3          | 3          | 4          | 4          | 4          | 15%            |
| <b>Outsourcing</b>              | 170        | 17%              | 199        | 232        | 272        | 318        | 371        | 434        | 17%            |
| - Platform Operations           | 104        | 18%              | 123        | 143        | 167        | 194        | 226        | 263        | 16%            |
| - Applications Operations       | 66         | 15%              | 76         | 89         | 105        | 124        | 145        | 171        | 18%            |
| <b>Processing Services</b>      | 44         | 11%              | 49         | 56         | 65         | 75         | 86         | 99         | 15%            |
| - Transaction Processing        | 22         | 18%              | 26         | 31         | 37         | 44         | 53         | 64         | 20%            |
| - Utility Processing            | 12         | 8%               | 13         | 14         | 16         | 17         | 18         | 19         | 8%             |
| - Other Processing              | 10         | 0%               | 10         | 11         | 12         | 14         | 15         | 16         | 10%            |
| <b>Network Services</b>         | 29         | 17%              | 34         | 40         | 49         | 60         | 72         | 87         | 21%            |
| - Electronic Information Svcs   | 21         | 14%              | 24         | 28         | 35         | 43         | 52         | 63         | 21%            |
| - Network Applications          | 8          | 25%              | 10         | 12         | 14         | 17         | 20         | 24         | 19%            |
| <b>Applications SW Products</b> | 195        | 15%              | 224        | 259        | 302        | 360        | 420        | 495        | 17%            |
| <b>Systems SW Products</b>      | 105        | 14%              | 120        | 138        | 159        | 183        | 210        | 241        | 15%            |
| <b>Turnkey Systems</b>          | 80         | 19%              | 95         | 110        | 129        | 149        | 174        | 202        | 16%            |
| - Equipment                     | 40         | 18%              | 47         | 53         | 60         | 67         | 75         | 84         | 12%            |
| - Software Products             | 25         | 20%              | 30         | 36         | 43         | 51         | 61         | 72         | 19%            |
| - Professional Services         | 15         | 20%              | 18         | 21         | 26         | 31         | 38         | 46         | 21%            |







## Information Services Market Brazil, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 2,202      | 15%              | 2,533      | 2,929      | 3,400      | 3,989      | 4,697      | 5,530      | 17%            |
| <b>Professional Services</b>    | 422        | 17%              | 492        | 568        | 656        | 770        | 920        | 1,092      | 17%            |
| - IS Consulting                 | 124        | 19%              | 148        | 175        | 208        | 247        | 292        | 352        | 19%            |
| - Education & Training          | 61         | 13%              | 69         | 78         | 89         | 105        | 123        | 140        | 15%            |
| - Software Development          | 237        | 16%              | 275        | 315        | 359        | 418        | 505        | 600        | 17%            |
| <b>Systems Integration</b>      | 80         | 9%               | 87         | 97         | 109        | 122        | 135        | 150        | 12%            |
| - Equipment                     | 30         | 7%               | 32         | 34         | 37         | 41         | 45         | 50         | 9%             |
| - Software Products             | 6          | 0%               | 6          | 7          | 7          | 8          | 8          | 9          | 8%             |
| - Professional Services         | 42         | 12%              | 47         | 54         | 62         | 70         | 78         | 87         | 13%            |
| - Other                         | 2          | 0%               | 2          | 2          | 3          | 3          | 4          | 4          | 15%            |
| <b>Outsourcing</b>              | 102        | 10%              | 112        | 124        | 138        | 154        | 172        | 194        | 12%            |
| - Platform Operations           | 56         | 9%               | 61         | 68         | 76         | 84         | 94         | 105        | 11%            |
| - Applications Operations       | 46         | 11%              | 51         | 56         | 62         | 70         | 78         | 89         | 12%            |
| <b>Processing Services</b>      | 88         | 7%               | 94         | 103        | 110        | 120        | 131        | 143        | 9%             |
| - Transaction Processing        | 39         | 10%              | 43         | 49         | 55         | 62         | 71         | 80         | 13%            |
| - Utility Processing            | 31         | 3%               | 32         | 33         | 33         | 34         | 34         | 35         | 2%             |
| - Other Processing              | 18         | 6%               | 19         | 21         | 22         | 24         | 26         | 28         | 8%             |
| <b>Network Services</b>         | 98         | 12%              | 110        | 129        | 149        | 175        | 204        | 238        | 17%            |
| - Electronic Information Svcs   | 83         | 12%              | 93         | 109        | 127        | 149        | 174        | 204        | 17%            |
| - Network Applications          | 15         | 13%              | 17         | 20         | 22         | 26         | 30         | 34         | 15%            |
| <b>Applications SW Products</b> | 678        | 18%              | 803        | 950        | 1,140      | 1,380      | 1,670      | 2,020      | 20%            |
| <b>Systems SW Products</b>      | 497        | 15%              | 570        | 658        | 759        | 883        | 1,027      | 1,194      | 16%            |
| <b>Turnkey Systems</b>          | 237        | 12%              | 265        | 300        | 339        | 385        | 438        | 499        | 13%            |
| - Equipment                     | 90         | 7%               | 96         | 104        | 112        | 121        | 131        | 141        | 8%             |
| - Software Products             | 84         | 17%              | 98         | 115        | 134        | 156        | 181        | 209        | 16%            |
| - Professional Services         | 63         | 13%              | 71         | 81         | 93         | 108        | 126        | 149        | 16%            |





## Information Services Market Venezuela, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| COUNTRY TOTAL              | 631        | 8%               | 680        | 705        | 739        | 789        | 851        | 917        | 6%             |
| Professional Services      | 139        | 9%               | 152        | 159        | 167        | 178        | 191        | 205        | 6%             |
| Systems Integration        | 17         | 12%              | 19         | 19         | 20         | 22         | 25         | 28         | 8%             |
| Outsourcing                | 7          | 14%              | 8          | 9          | 9          | 10         | 11         | 12         | 8%             |
| Processing Services        | 106        | 6%               | 112        | 114        | 118        | 125        | 134        | 144        | 5%             |
| Network Services           | 20         | 0%               | 20         | 21         | 22         | 24         | 25         | 26         | 5%             |
| Applications SW Products   | 174        | 9%               | 189        | 198        | 212        | 230        | 252        | 276        | 8%             |
| Systems SW Products        | 80         | 9%               | 87         | 89         | 91         | 94         | 98         | 102        | 3%             |
| Turnkey Systems            | 88         | 6%               | 93         | 96         | 100        | 106        | 115        | 124        | 6%             |







## Information Services Market Other Latin America, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| AREA TOTAL                 | 1,125      | 20%              | 1,349      | 1,632      | 1,968      | 2,395      | 2,915      | 3,553      | 21%            |
| Professional Services      | 122        | 20%              | 146        | 177        | 214        | 263        | 323        | 397        | 22%            |
| Systems Integration        | 12         | 8%               | 13         | 14         | 16         | 19         | 22         | 26         | 15%            |
| Outsourcing                | 10         | 20%              | 12         | 14         | 16         | 20         | 24         | 30         | 20%            |
| Processing Services        | 96         | 9%               | 105        | 116        | 130        | 149        | 171        | 196        | 13%            |
| Network Services           | 21         | 24%              | 26         | 32         | 39         | 48         | 59         | 73         | 23%            |
| Applications SW Products   | 440        | 23%              | 543        | 675        | 833        | 1,026      | 1,267      | 1,565      | 24%            |
| Systems SW Products        | 188        | 17%              | 220        | 260        | 305        | 360        | 424        | 500        | 18%            |
| Turnkey Systems            | 236        | 20%              | 284        | 344        | 415        | 510        | 625        | 766        | 22%            |





## Information Services Market Worldwide, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>WORLDWIDE TOTAL</b>          | 318,696    | 11%              | 352,586    | 392,316    | 439,805    | 490,518    | 553,459    | 619,008    | 12%            |
| <b>Professional Services</b>    | 76,121     | 8%               | 82,473     | 89,254     | 98,164     | 107,220    | 118,315    | 128,344    | 9%             |
| <b>Systems Integration</b>      | 22,036     | 11%              | 24,492     | 27,938     | 32,057     | 36,536     | 41,870     | 47,527     | 14%            |
| <b>Outsourcing</b>              | 26,829     | 19%              | 32,016     | 37,220     | 44,038     | 51,908     | 61,500     | 72,155     | 18%            |
| <b>Processing Services</b>      | 42,596     | 8%               | 45,961     | 49,040     | 53,319     | 57,249     | 61,912     | 66,250     | 8%             |
| <b>Network Services</b>         | 26,124     | 15%              | 29,981     | 34,614     | 40,759     | 47,757     | 56,618     | 67,002     | 17%            |
| <b>Applications SW Products</b> | 47,885     | 14%              | 54,492     | 63,707     | 73,239     | 83,239     | 96,780     | 111,114    | 15%            |
| <b>Systems SW Products</b>      | 43,688     | 9%               | 47,414     | 51,866     | 56,231     | 60,976     | 66,897     | 72,998     | 9%             |
| <b>Turnkey Systems</b>          | 33,417     | 7%               | 35,757     | 38,677     | 41,998     | 45,633     | 49,567     | 53,618     | 8%             |

Source: INPUT





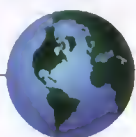


## Information Services Market Asia/Pacific, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>REGIONAL TOTAL</b>           | 66,319     | 10%              | 72,904     | 78,972     | 89,619     | 99,038     | 112,093    | 120,827    | 11%            |
| <b>Professional Services</b>    | 26,769     | 8%               | 28,963     | 31,254     | 34,704     | 37,856     | 42,090     | 44,435     | 9%             |
| <b>Systems Integration</b>      | 4,956      | 12%              | 5,566      | 6,019      | 6,969      | 7,917      | 9,205      | 10,216     | 13%            |
| <b>Outsourcing</b>              | 5,164      | 12%              | 5,795      | 6,136      | 7,109      | 8,170      | 9,684      | 10,756     | 13%            |
| <b>Processing Services</b>      | 9,304      | 10%              | 10,259     | 10,844     | 12,246     | 13,090     | 14,328     | 14,800     | 8%             |
| <b>Network Services</b>         | 5,574      | 12%              | 6,237      | 6,825      | 7,975      | 9,095      | 10,716     | 12,417     | 15%            |
| <b>Applications SW Products</b> | 5,581      | 15%              | 6,418      | 7,324      | 8,662      | 9,771      | 11,606     | 12,867     | 15%            |
| <b>Systems SW Products</b>      | 4,497      | 10%              | 4,944      | 5,392      | 6,246      | 6,928      | 7,818      | 8,451      | 11%            |
| <b>Turnkey Systems</b>          | 4,474      | 6%               | 4,722      | 5,178      | 5,708      | 6,211      | 6,646      | 6,885      | 8%             |

Source: INPUT





## Information Services Market Australia, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 3,199      | 9%               | 3,495      | 3,851      | 4,268      | 4,754      | 5,317      | 5,951      | 11%            |
| <b>Professional Services</b>    | 712        | 11%              | 792        | 886        | 990        | 1,120      | 1,265      | 1,434      | 13%            |
| - IS Consulting                 | 192        | 14%              | 218        | 248        | 280        | 320        | 365        | 415        | 14%            |
| - Education & Training          | 75         | 5%               | 79         | 84         | 90         | 96         | 104        | 114        | 8%             |
| - Software Development          | 445        | 11%              | 495        | 554        | 620        | 704        | 796        | 905        | 13%            |
| <b>Systems Integration</b>      | 261        | 10%              | 288        | 323        | 363        | 406        | 458        | 515        | 12%            |
| - Equipment                     | 112        | 9%               | 122        | 135        | 151        | 169        | 189        | 212        | 12%            |
| - Software Products             | 27         | 11%              | 30         | 33         | 36         | 40         | 45         | 50         | 11%            |
| - Professional Services         | 117        | 11%              | 130        | 147        | 166        | 185        | 210        | 237        | 13%            |
| - Other                         | 5          | 20%              | 6          | 8          | 10         | 12         | 14         | 16         | 22%            |
| <b>Outsourcing</b>              | 145        | 7%               | 155        | 165        | 177        | 191        | 206        | 223        | 8%             |
| - Platform Operations           | 84         | 6%               | 89         | 94         | 100        | 108        | 116        | 125        | 7%             |
| - Applications Operations       | 61         | 8%               | 66         | 71         | 77         | 83         | 90         | 98         | 8%             |
| <b>Processing Services</b>      | 310        | 7%               | 332        | 353        | 377        | 404        | 435        | 470        | 7%             |
| - Transaction Processing        | 264        | 7%               | 283        | 300        | 320        | 343        | 370        | 400        | 7%             |
| - Utility Processing            | 15         | 7%               | 16         | 17         | 18         | 19         | 20         | 21         | 6%             |
| - Other Processing              | 31         | 6%               | 33         | 36         | 39         | 42         | 45         | 49         | 8%             |
| <b>Network Services</b>         | 330        | 10%              | 364        | 410        | 468        | 535        | 622        | 717        | 15%            |
| - Electronic Information Svcs   | 238        | 9%               | 259        | 287        | 322        | 365        | 425        | 490        | 14%            |
| - Network Applications          | 92         | 14%              | 105        | 123        | 146        | 170        | 197        | 227        | 17%            |
| <b>Applications SW Products</b> | 665        | 10%              | 731        | 815        | 921        | 1,041      | 1,176      | 1,328      | 13%            |
| <b>Systems SW Products</b>      | 475        | 7%               | 508        | 544        | 587        | 640        | 700        | 766        | 9%             |
| <b>Turnkey Systems</b>          | 301        | 8%               | 325        | 355        | 385        | 417        | 455        | 498        | 9%             |
| - Equipment                     | 137        | 7%               | 146        | 158        | 170        | 183        | 200        | 220        | 9%             |
| - Software Products             | 71         | 6%               | 75         | 80         | 86         | 93         | 101        | 110        | 8%             |
| - Professional Services         | 93         | 12%              | 104        | 117        | 129        | 141        | 154        | 168        | 10%            |

Source: INPUT







## Information Services Market China, 1995-2000

| PRODUCT/SERVICE CATEGORIES | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|----------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| COUNTRY TOTAL              | 249        | 21%              | 301        | 368        | 453        | 564        | 712        | 924        | 25%            |
| Professional Services      | 75         | 20%              | 90         | 111        | 136        | 170        | 215        | 275        | 25%            |
| Systems Integration        | 12         | 8%               | 13         | 14         | 15         | 17         | 20         | 23         | 12%            |
| Outsourcing                | 10         | 10%              | 11         | 13         | 15         | 18         | 21         | 25         | 18%            |
| Processing Services        | 15         | 20%              | 18         | 21         | 25         | 29         | 34         | 39         | 17%            |
| Network Services           | 12         | 42%              | 17         | 24         | 33         | 47         | 65         | 90         | 40%            |
| Applications SW Products   | 105        | 24%              | 130        | 160        | 200        | 250        | 320        | 430        | 27%            |
| Systems SW Products        | 5          | 0%               | 5          | 6          | 7          | 8          | 9          | 10         | 15%            |
| Turnkey Systems            | 15         | 13%              | 17         | 19         | 22         | 25         | 28         | 32         | 13%            |

Source: INPUT





## Information Services Market Hong Kong, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 745        | 15%              | 856        | 995        | 1,164      | 1,367      | 1,598      | 1,861      | 17%            |
| <b>Professional Services</b>    | 146        | 11%              | 162        | 183        | 207        | 232        | 259        | 292        | 13%            |
| - IS Consulting                 | 39         | 15%              | 45         | 52         | 61         | 70         | 80         | 91         | 15%            |
| - Education & Training          | 13         | 8%               | 14         | 15         | 16         | 17         | 17         | 18         | 5%             |
| - Software Development          | 94         | 10%              | 103        | 116        | 130        | 145        | 162        | 183        | 12%            |
| <b>Systems Integration</b>      | 41         | 11%              | 46         | 52         | 58         | 67         | 79         | 93         | 15%            |
| - Equipment                     | 19         | 11%              | 21         | 25         | 28         | 32         | 38         | 44         | 16%            |
| - Software Products             | 4          | 10%              | 4          | 5          | 5          | 6          | 8          | 11         | 22%            |
| - Professional Services         | 15         | 13%              | 17         | 19         | 21         | 25         | 28         | 33         | 14%            |
| - Other                         | 3          | 10%              | 3          | 3          | 4          | 4          | 5          | 5          | 11%            |
| <b>Outsourcing</b>              | 39         | 23%              | 48         | 59         | 73         | 90         | 110        | 134        | 23%            |
| - Platform Operations           | 24         | 25%              | 30         | 37         | 45         | 55         | 67         | 81         | 22%            |
| - Applications Operations       | 15         | 20%              | 18         | 22         | 28         | 35         | 43         | 53         | 24%            |
| <b>Processing Services</b>      | 80         | 6%               | 85         | 92         | 99         | 108        | 119        | 131        | 9%             |
| - Transaction Processing        | 58         | 5%               | 61         | 66         | 71         | 77         | 82         | 88         | 8%             |
| - Utility Processing            | 13         | 8%               | 14         | 15         | 17         | 19         | 23         | 27         | 14%            |
| - Other Processing              | 9          | 11%              | 10         | 11         | 11         | 12         | 14         | 16         | 10%            |
| <b>Network Services</b>         | 55         | 18%              | 65         | 77         | 92         | 110        | 131        | 157        | 19%            |
| - Electronic Information Svcs   | 24         | 17%              | 28         | 33         | 39         | 46         | 55         | 66         | 19%            |
| - Network Applications          | 31         | 19%              | 37         | 44         | 53         | 64         | 76         | 91         | 20%            |
| <b>Applications SW Products</b> | 162        | 19%              | 192        | 230        | 278        | 340        | 410        | 490        | 21%            |
| <b>Systems SW Products</b>      | 165        | 18%              | 194        | 230        | 275        | 325        | 380        | 440        | 18%            |
| <b>Turnkey Systems</b>          | 57         | 12%              | 64         | 72         | 82         | 95         | 110        | 124        | 14%            |
| - Equipment                     | 27         | 15%              | 31         | 34         | 39         | 45         | 52         | 59         | 14%            |
| - Software Products             | 13         | 8%               | 14         | 15         | 17         | 20         | 24         | 28         | 15%            |
| - Professional Services         | 17         | 12%              | 19         | 23         | 26         | 30         | 34         | 37         | 14%            |

Source: INPUT







## Information Services Market India, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 618        | 31%              | 807        | 1,053      | 1,382      | 1,814      | 2,385      | 3,144      | 31%            |
| <b>Professional Services</b>    | 258        | 31%              | 338        | 443        | 585        | 775        | 1,030      | 1,374      | 32%            |
| <b>Systems Integration</b>      | 3          | 33%              | 4          | 5          | 6          | 7          | 8          | 9          | 18%            |
| <b>Processing Services</b>      | 20         | 10%              | 22         | 24         | 27         | 31         | 36         | 41         | 13%            |
| <b>Network Services</b>         | 12         | 25%              | 15         | 18         | 22         | 27         | 34         | 43         | 23%            |
| <b>Applications SW Products</b> | 185        | 36%              | 252        | 343        | 465        | 630        | 850        | 1,150      | 35%            |
| <b>Systems SW Products</b>      | 115        | 26%              | 145        | 182        | 230        | 287        | 358        | 444        | 25%            |
| <b>Turnkey Systems</b>          | 25         | 24%              | 31         | 38         | 47         | 57         | 69         | 83         | 22%            |

Source: INPUT





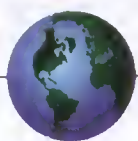
## Information Services Market Japan, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 56,152     | 9%               | 61,016     | 64,938     | 72,937     | 79,042     | 87,976     | 91,574     | 8%             |
| <b>Professional Services</b>    | 24,540     | 7%               | 26,359     | 28,183     | 31,070     | 33,514     | 36,862     | 38,094     | 8%             |
| - IS Consulting                 | 1,620      | -1%              | 1,608      | 1,691      | 1,864      | 2,011      | 2,175      | 2,209      | 7%             |
| - Education & Training          | 1,006      | 5%               | 1,054      | 1,127      | 1,212      | 1,274      | 1,364      | 1,486      | 7%             |
| - Software Development          | 21,914     | 8%               | 23,697     | 25,365     | 27,994     | 30,229     | 33,323     | 34,399     | 8%             |
| <b>Systems Integration</b>      | 4,323      | 11%              | 4,820      | 5,131      | 5,907      | 6,639      | 7,654      | 8,334      | 12%            |
| - Equipment                     | 1,535      | 10%              | 1,692      | 1,785      | 2,044      | 2,291      | 2,625      | 2,842      | 11%            |
| - Software Products             | 445        | 8%               | 482        | 503        | 579        | 637        | 712        | 767        | 10%            |
| - Professional Services         | 2,231      | 14%              | 2,545      | 2,740      | 3,166      | 3,605      | 4,202      | 4,600      | 13%            |
| - Other                         | 112        | -10%             | 101        | 103        | 118        | 106        | 115        | 125        | 4%             |
| <b>Outsourcing</b>              | 4,548      | 11%              | 5,064      | 5,260      | 6,053      | 6,877      | 8,094      | 8,791      | 12%            |
| - Platform Operations           | 4,057      | 11%              | 4,522      | 4,713      | 5,436      | 6,203      | 7,317      | 7,973      | 12%            |
| - Applications Operations       | 491        | 10%              | 542        | 547        | 617        | 674        | 777        | 818        | 9%             |
| <b>Processing Services</b>      | 8,254      | 10%              | 9,091      | 9,545      | 10,794     | 11,461     | 12,493     | 12,729     | 7%             |
| - Transaction Processing        | 7,025      | 11%              | 7,764      | 8,238      | 9,369      | 10,005     | 10,981     | 11,214     | 8%             |
| - Utility Processing            | 404        | 6%               | 427        | 410        | 443        | 436        | 400        | 382        | -2%            |
| - Other Processing              | 825        | 9%               | 900        | 897        | 982        | 1,020      | 1,112      | 1,133      | 5%             |
| <b>Network Services</b>         | 4,604      | 10%              | 5,065      | 5,390      | 6,199      | 6,876      | 7,918      | 8,882      | 12%            |
| - Electronic Information Svcs   | 2,348      | 16%              | 2,725      | 2,857      | 3,248      | 3,555      | 4,054      | 4,521      | 11%            |
| - Network Applications          | 2,256      | 4%               | 2,340      | 2,533      | 2,951      | 3,321      | 3,864      | 4,361      | 13%            |
| <b>Applications SW Products</b> | 3,425      | 12%              | 3,844      | 4,221      | 4,887      | 5,138      | 5,894      | 5,769      | 8%             |
| <b>Systems SW Products</b>      | 2,864      | 7%               | 3,051      | 3,182      | 3,647      | 3,873      | 4,223      | 4,212      | 7%             |
| <b>Turnkey Systems</b>          | 3,594      | 4%               | 3,722      | 4,026      | 4,380      | 4,664      | 4,838      | 4,763      | 5%             |
| - Equipment                     | 1,154      | -1%              | 1,143      | 1,188      | 1,243      | 1,292      | 1,306      | 1,267      | 2%             |
| - Software Products             | 1,448      | 4%               | 1,500      | 1,598      | 1,680      | 1,763      | 1,814      | 1,767      | 3%             |
| - Professional Services         | 992        | 9%               | 1,079      | 1,240      | 1,457      | 1,609      | 1,718      | 1,729      | 10%            |

Source: INPUT







## Information Services Market New Zealand, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 1,050      | 11%              | 1,161      | 1,296      | 1,446      | 1,623      | 1,817      | 2,037      | 12%            |
| <b>Professional Services</b>    | 292        | 12%              | 326        | 372        | 422        | 480        | 545        | 617        | 14%            |
| - IS Consulting                 | 80         | 13%              | 90         | 102        | 116        | 134        | 152        | 170        | 14%            |
| - Education & Training          | 30         | 10%              | 33         | 37         | 43         | 48         | 55         | 62         | 13%            |
| - Software Development          | 182        | 12%              | 203        | 233        | 263        | 298        | 338        | 385        | 14%            |
| <b>Systems Integration</b>      | 68         | 16%              | 79         | 90         | 104        | 120        | 139        | 161        | 15%            |
| - Equipment                     | 25         | 12%              | 28         | 29         | 33         | 37         | 43         | 51         | 13%            |
| - Software Products             | 8          | 25%              | 10         | 12         | 14         | 16         | 20         | 24         | 19%            |
| - Professional Services         | 33         | 18%              | 39         | 47         | 55         | 64         | 73         | 83         | 16%            |
| - Other                         | 2          | 0%               | 2          | 2          | 2          | 3          | 3          | 3          | 8%             |
| <b>Outsourcing</b>              | 42         | 10%              | 46         | 52         | 59         | 67         | 76         | 86         | 13%            |
| - Platform Operations           | 23         | 13%              | 26         | 30         | 35         | 40         | 46         | 52         | 15%            |
| - Applications Operations       | 19         | 5%               | 20         | 22         | 24         | 27         | 30         | 34         | 11%            |
| <b>Processing Services</b>      | 139        | 8%               | 150        | 160        | 170        | 183        | 197        | 213        | 7%             |
| - Transaction Processing        | 120        | 8%               | 129        | 137        | 145        | 155        | 167        | 180        | 7%             |
| - Utility Processing            | 11         | 9%               | 12         | 13         | 14         | 16         | 18         | 20         | 11%            |
| - Other Processing              | 8          | 13%              | 9          | 10         | 11         | 12         | 12         | 13         | 8%             |
| <b>Network Services</b>         | 57         | 14%              | 65         | 74         | 86         | 99         | 115        | 135        | 16%            |
| - Electronic Information Svcs   | 45         | 16%              | 52         | 59         | 68         | 78         | 90         | 105        | 15%            |
| - Network Applications          | 12         | 8%               | 13         | 15         | 18         | 21         | 25         | 30         | 18%            |
| <b>Applications SW Products</b> | 144        | 11%              | 160        | 179        | 200        | 224        | 250        | 279        | 12%            |
| <b>Systems SW Products</b>      | 151        | 10%              | 166        | 184        | 206        | 231        | 258        | 290        | 12%            |
| <b>Turnkey Systems</b>          | 157        | 8%               | 169        | 185        | 199        | 219        | 237        | 256        | 9%             |
| - Equipment                     | 69         | 6%               | 73         | 80         | 87         | 95         | 102        | 110        | 9%             |
| - Software Products             | 42         | 10%              | 46         | 51         | 55         | 61         | 67         | 73         | 10%            |
| - Professional Services         | 46         | 9%               | 50         | 54         | 57         | 63         | 68         | 73         | 8%             |

Source: INPUT





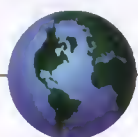
## Information Services Market Singapore, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 921        | 15%              | 1,056      | 1,210      | 1,389      | 1,602      | 1,858      | 2,160      | 15%            |
| <b>Professional Services</b>    | 198        | 16%              | 229        | 263        | 302        | 349        | 408        | 480        | 16%            |
| <b>Systems Integration</b>      | 39         | 18%              | 46         | 54         | 64         | 77         | 93         | 112        | 19%            |
| <b>Outsourcing</b>              | 10         | 10%              | 11         | 12         | 14         | 16         | 18         | 21         | 14%            |
| <b>Processing Services</b>      | 203        | 11%              | 226        | 252        | 282        | 315        | 353        | 395        | 12%            |
| <b>Network Services</b>         | 115        | 21%              | 139        | 168        | 203        | 247        | 302        | 370        | 22%            |
| <b>Applications SW Products</b> | 152        | 17%              | 178        | 208        | 243        | 286        | 338        | 400        | 18%            |
| <b>Systems SW Products</b>      | 122        | 11%              | 135        | 150        | 166        | 183        | 202        | 222        | 10%            |
| <b>Turnkey Systems</b>          | 82         | 12%              | 92         | 103        | 115        | 129        | 144        | 160        | 12%            |

Source: INPUT







## Information Services Market South Korea, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 2,197      | 28%              | 2,814      | 3,612      | 4,631      | 5,960      | 7,683      | 9,898      | 29%            |
| <b>Professional Services</b>    | 325        | 25%              | 406        | 508        | 634        | 793        | 1,007      | 1,279      | 26%            |
| <b>Systems Integration</b>      | 170        | 32%              | 224        | 296        | 390        | 511        | 669        | 870        | 31%            |
| <b>Outsourcing</b>              | 305        | 27%              | 387        | 492        | 625        | 806        | 1,040      | 1,341      | 28%            |
| <b>Processing Services</b>      | 172        | 22%              | 210        | 256        | 312        | 378        | 457        | 553        | 21%            |
| <b>Network Services</b>         | 295        | 34%              | 395        | 530        | 710        | 960        | 1,295      | 1,740      | 35%            |
| <b>Applications SW Products</b> | 420        | 28%              | 537        | 688        | 880        | 1,135      | 1,465      | 1,890      | 29%            |
| <b>Systems SW Products</b>      | 385        | 26%              | 485        | 611        | 770        | 962        | 1,200      | 1,500      | 25%            |
| <b>Turnkey Systems</b>          | 125        | 36%              | 170        | 231        | 310        | 415        | 550        | 725        | 34%            |

Source: INPUT





## Information Services Market Taiwan, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>COUNTRY TOTAL</b>            | 716        | 16%              | 828        | 961        | 1,117      | 1,301      | 1,515      | 1,769      | 16%            |
| <b>Professional Services</b>    | 186        | 16%              | 216        | 250        | 291        | 341        | 399        | 469        | 17%            |
| - IS Consulting                 | 49         | 14%              | 56         | 64         | 74         | 86         | 101        | 118        | 16%            |
| - Education & Training          | 15         | 13%              | 17         | 19         | 22         | 25         | 28         | 31         | 13%            |
| - Software Development          | 122        | 17%              | 143        | 167        | 195        | 230        | 270        | 320        | 17%            |
| <b>Systems Integration</b>      | 29         | 17%              | 34         | 40         | 46         | 54         | 63         | 74         | 17%            |
| - Equipment                     | 13         | 8%               | 14         | 16         | 18         | 21         | 24         | 28         | 15%            |
| - Software Products             | 3          | 67%              | 5          | 7          | 9          | 11         | 13         | 15         | 25%            |
| - Professional Services         | 2          | 0%               | 2          | 2          | 2          | 3          | 3          | 4          | 15%            |
| - Other                         | 11         | 18%              | 13         | 15         | 17         | 19         | 23         | 27         | 16%            |
| <b>Outsourcing</b>              | 65         | 12%              | 73         | 83         | 93         | 105        | 119        | 135        | 13%            |
| - Platform Operations           | 41         | 12%              | 46         | 52         | 58         | 65         | 74         | 84         | 13%            |
| - Applications Operations       | 24         | 13%              | 27         | 31         | 35         | 40         | 45         | 51         | 14%            |
| <b>Processing Services</b>      | 86         | 14%              | 98         | 111        | 126        | 143        | 161        | 181        | 13%            |
| - Transaction Processing        | 48         | 17%              | 56         | 65         | 75         | 86         | 98         | 111        | 15%            |
| - Utility Processing            | 22         | 9%               | 24         | 26         | 28         | 31         | 34         | 37         | 9%             |
| - Other Processing              | 16         | 13%              | 18         | 20         | 23         | 26         | 29         | 33         | 13%            |
| <b>Network Services</b>         | 68         | 19%              | 81         | 97         | 118        | 141        | 170        | 205        | 20%            |
| - Electronic Information Svcs   | 56         | 18%              | 66         | 78         | 95         | 112        | 133        | 158        | 19%            |
| - Network Applications          | 12         | 25%              | 15         | 19         | 23         | 29         | 37         | 47         | 26%            |
| <b>Applications SW Products</b> | 83         | 18%              | 98         | 118        | 142        | 172        | 208        | 252        | 21%            |
| <b>Systems SW Products</b>      | 105        | 16%              | 122        | 142        | 165        | 190        | 218        | 250        | 15%            |
| <b>Turnkey Systems</b>          | 94         | 13%              | 106        | 120        | 136        | 155        | 177        | 203        | 14%            |
| - Equipment                     | 43         | 7%               | 46         | 50         | 53         | 57         | 61         | 65         | 7%             |
| - Software Products             | 20         | 15%              | 23         | 26         | 30         | 34         | 39         | 46         | 15%            |
| - Professional Services         | 31         | 19%              | 37         | 44         | 53         | 64         | 77         | 92         | 20%            |

Source: INPUT







## Information Services Market Other Asia/Pacific, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>AREA TOTAL</b>               | 472        | 21%              | 570        | 688        | 832        | 1,011      | 1,232      | 1,509      | 21%            |
| <b>Professional Services</b>    | 37         | 22%              | 45         | 55         | 67         | 82         | 100        | 121        | 22%            |
| <b>Systems Integration</b>      | 10         | 20%              | 12         | 14         | 16         | 19         | 22         | 25         | 16%            |
| <b>Processing Services</b>      | 25         | 8%               | 27         | 30         | 34         | 38         | 43         | 48         | 12%            |
| <b>Network Services</b>         | 26         | 19%              | 31         | 37         | 44         | 53         | 64         | 78         | 20%            |
| <b>Applications SW Products</b> | 240        | 23%              | 296        | 362        | 446        | 555        | 695        | 879        | 24%            |
| <b>Systems SW Products</b>      | 110        | 21%              | 133        | 161        | 193        | 229        | 270        | 317        | 19%            |
| <b>Turnkey Systems</b>          | 24         | 8%               | 26         | 29         | 32         | 35         | 38         | 41         | 10%            |

Source: INPUT

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## Information Services Market Middle East/Africa, 1995-2000

| PRODUCT/SERVICE CATEGORIES      | 1994 (\$M) | Growth 94-95 (%) | 1995 (\$M) | 1996 (\$M) | 1997 (\$M) | 1998 (\$M) | 1999 (\$M) | 2000 (\$M) | CAGR 95-00 (%) |
|---------------------------------|------------|------------------|------------|------------|------------|------------|------------|------------|----------------|
| <b>REGIONAL TOTAL</b>           | 1,715      | 16%              | 1,991      | 2,339      | 2,764      | 3,293      | 3,928      | 4,666      | 19%            |
| <b>Professional Services</b>    | 505        | 22%              | 615        | 765        | 945        | 1,170      | 1,450      | 1,800      | 24%            |
| <b>Systems Integration</b>      | 40         | 10%              | 44         | 50         | 55         | 62         | 69         | 78         | 12%            |
| <b>Outsourcing</b>              | 8          | 13%              | 9          | 11         | 14         | 17         | 20         | 23         | 21%            |
| <b>Processing Services</b>      | 400        | 11%              | 445        | 490        | 545        | 600        | 675        | 750        | 11%            |
| <b>Network Services</b>         | 25         | 12%              | 28         | 31         | 35         | 39         | 44         | 50         | 12%            |
| <b>Applications SW Products</b> | 510        | 18%              | 600        | 715        | 860        | 1,060      | 1,290      | 1,550      | 21%            |
| <b>Systems SW Products</b>      | 92         | 11%              | 102        | 114        | 125        | 140        | 155        | 170        | 11%            |
| <b>Turnkey Systems</b>          | 135        | 10%              | 148        | 163        | 185        | 205        | 225        | 245        | 11%            |

Source: INPUT







